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Front Cover

Himalayan Tahr	Zaheer Bakshi

Front Inner Cover

Monal (Male)	Alok Negi
Monal (Female)	Alok Negi

Back Inside Cover

Sambhar	Vishnu Sharan Rastogi
Bharal	Alok Negi

Back Cover

Green Backed Tit	Zaheer Bakshi
Griffon	Zaheer Bakshi

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EDITORIAL

I extend a warm welcome to the Executive Committee members of W.P.S., who were elected on 12th November 2017. I firmly believe that the present executive committee along with the other members of the society will join hands to strengthen and prosper the society into new heights. I, on behalf of the editorial board, request to the learned society members and general people to write on wildlife, their keen observations on behaviour and life pattern on wild animals.

India's biodiversity is unique and unlimited. It is found in air, water (Deep Sea) on land (Terrestrial) even in icy capped altitudes. Variety of flora and fauna including all the biological organisms from unicelluler Cyanobacteria, Protozoans to all multicellular organisims - Fungi, Plants, Insects, Rodents, Lion, Tiger and interaction with Human can be studied and observations can be made black & white. Send them to editorial office for publication in Cheetal. Please follow the pattern of write the articles and research papers.

In the present issue of "Cheetal", you will find variety of research papers and research articles on wildlife. The Himalayan Tahr (photo on front cover page) found at high altitude. There are two common species of Tahr but now both are dwindling day by day. One of the excellent research paper on Shrew (Mole) - the Pigmy white toothed shrew, perhaps the smallest mammal in India, is included herewith. Other research paper on mammals include - Mammalian Diversity and Sumatran Tiger. (Author is one of the best writer on Wildlife). We know very much about Indian Tiger but it would be exciting to know about the Sumatran Tiger. In another article the mating ritual of Puntius ticto has been described and is very interesting.

One of student wildlife lover has written on well known "Rajaji Tiger Reserve". His thoughts about wildlife conservation are remarkable.

Hyena, Dhole, wolf, Jackal and Fox are more or less similar mammal in every aspect of life. The close encounter and keen observation on "Jackal" has bee described in a writeup under the heading of "Our experiences with Pheall". This is really a very informative and interesting research finding. You will certainly enjoy and enrich your knowledge by going through such and articles on Wildlife. Try to do the similar observation on other wildlife animal and write to your experiences as wildlifer.

After mammalian fauna - two research papers on fish fauna are included. These are also very informative and useful to fish Biologists. "Air Pollution" is not only affecting humanbeing but also wild animals like birds and mammal as observed by one of our executive member.

Last, but not least, you will find an article on "Baya Pakshi" (The Weaver Bird) in Hindi by a learned (Retd.) Forest Officer and prolific writer on wildlife.

Dr. S. P. Singh
Member, Editorial Board, Cheetal

Himalayan Tahr (*Hemitragus jemlalicus*)

Zaheer Bakshi
6/11, Nemi Road, Dalanwala, Dehradun

There are two species of Tahr found in India. The Himalayan Tahr and the Nilgiri Tahr (Nilgiritragus hylocrius). Tahr are large ungulated wild goats.

The Himalayan Tahr is found at an altitude of 8000 feet to 15000 feet. Its habitat extends from south Tibet, Northern India, Nepal, Sikkim and Bhutan. It has a small head, small pointed ears, large eyes and short horns that curve backwards, The males are larger in size than the females and almost twice the body weight. They have thick wooly coat and a soft warm undercoat to keem them warm in harsh Himalayan weather. Males have coppery brown ruff and mantle of flowing hair draping from the neck and shoulders to its knees and from its back and rump to its flank and thighs.

Seen in high altitude grassland called "Bugials" in local language. These animals are experts at climbing cliffs and steep mountain slopes. These slopes not only provide a safe heaven from predators but also allows them to reach out to fresh grass which is not accessible to other species.

Not much is know about the exact numbers but the species is threatened by loss of habitat, weather change and poaching. They have been introduced in New Zealand and South Africa where they have adapted well. They are classified as threatened by the International union for conservation of Nature (ICUN).

On a lazy Saturday morning, I woke up thinking what to do. I called one of our society member and a dear friend Mr Alok Negi. I asked him if there are any places to explore near Rudrapriyag and he said he know many and invited me for a trek. I packed my bags and found myself on the road to Rudrapriyag by mid-day. Picked up Alok and reached Chopta by 8:30pm. The temp had dropped to sub zero but Alok is well known in the area and checked into a small yet comfortable homestay.

At the break of dawn we started our 3.5km trek to tungnath temple. At one point I stopped to take photos of our state bird "Himalayan Monal (lophophorus impejanus)" when on my right I heard a shrill bird like call. I asked Alok if it was a raptor but was pleasantly surprised when he pointed out a Tahr standing at the edge of the mountain and calling out for his family. The spectacular view of the Himalayas and the fresh crisp air rejuvenated by body, mind and soul. I stopped to capture Himalayan Griffon (Gyps himalayensis), Alpine accentor (Prunella collaris). Took few more photos of some lovely little birds found in the region.

It was a short three day trip but truly enjoyable. A trip I shall cherish afor a long time to come.

About the Author :

Zaheer Bakshi, belongs to Dehradun. He completed his B.Com. from DAV PG College Dehradun . He works as a Materials Supervisor for Offshore Drilling Rigs and has a work rotation of 28 days on and 28 days off. During his field break he is a passionate wildlife photographer and a wildlife enthusiast. He is also a Life member and Asst Secretary of The Wildlife Preservation Society. Dehradun. He has been contributing wildlife photographs for 'Cheetal' regularly.

Taxonomic Account and Field Observations on the Biology of *Puntius ticto* (Hamilton) in Song River, Doon Valley, Uttarakhand.

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Abstract

In the present communication the fresh water fish *Puntius ticto* (Hamilton) on inhabiting of fast flowing rivers and stream of Himalaya and sub-Himalaya ranges, Yamuna, Ganga and also found in Song river at Raiwala, Nepali Farm, Chhidarwala, Lacchiwala and Gularghati in eastern Doon Valley. The fish is a column feeder and omnivorous.

Keywords : Puntius, Biology, Song river

Introduction

Song river is a spring fed river originate different small rivulets of the mountainous ranges of Dhanolti, crossing with Sahastradhara streams, flow downward towards eastern Doon valley basins and finally it assimilates into Ganga at Raiwala. There are about 24 fishes belonging to the family Cyprinidae out of which *Puntius ticto* is gregarious and lives in association with *Puntius sophore* in the stagnant water of the Song river. Hora and Mukerjee (1936) were the first to publish a systematic list of fishes of Doon Valley. Later on the fish fauns of Doon valley attract the attention of Lal and Chatterjee (1962), Singh (1964), Grover (1970), Grover et.al. (1994) who contributed only in giving the systematic list of some fishes. However biological studies remained neglected except for the work of (Grover 1971, 79) on *Barilius* and *Puntius* and Rauthan et.al. (2001) on *Barilius vagra*. Present investigation on the *Puntius ticto* in Eastern Doon Valley in undertaken to study is taxonomy observation and biology.

Materials and Methods

The fishes were collected from Song river in three stations Raiwal, Nepali Farm and Chhidarwala all the year round regularity at an interval of 15 days. The fishes were caught by the cast net, drag net, sweeping net, towning net and in stagnant water the fishes were collected by hand. The present investigation was undertaken to study the taxonomy account, habit & habitat, food & feeding habits and breeding behaviour of the fish.

Observation

In the present studies the fish varies from 8 to 10.5 cm. Body is strongly compressed and elevated. Length of head is 5 and the height of body ranged from 3 to 3.4 in the total length. Eye diameter is 3.1 in the length of head. Upper jaw is slightly longer than the lower jaw. Teeth are pharyngeal and pointed. Barbels are absent, caudal fin is forked, lateral line is incomplete, body is silvery and fins are black. A black blotch is located on the side of the tail before the base of caudal fin, abdomen is rounded, snout is slightly compressed and conically rounded, scales are very small.

Fin Formula :

D.11(3/7), P.15, V.9, A-8, C-20, LI-29, Ltr. 6/7

Found in Raiwala, Nepali Farm and Chhidarwala in selected three stations. Freshwaters of India, Pakistan, Bangladesh and Garhwal and Kumauan Himalaya.

(a) Taxonomic Account

Fishes are among the earliest vertebrates going back to the Devonian periods also called the 'Age of Fishes'. About 30,000 species of fishes are known some live in fresh water. According to Talwar and Jhingran (1991) 21,723 fish species known to Icthyologist. Over 40% live in freshwater. Indian inland fishes represented 930 species. The credit fish taxonomy of Indian Fresh waters fishes goes to Francis Buchanan, well known Francis Hamilton (1922) in his work 'An account of the fishes found in River Ganges and its branches' gave a well illustrated account of 269 species from Gangetic system. Later McClelland (1939) described 136 species of fishes from Eastern Himalaya part of the upper Assam on Indian Cyprinidae. In 'Asiatic Researches of Bengal' Francis Day (1878, 1889) has given an extensive account on the taxonomy of the Indian continental freshwater and marine fishes. His description of 1340 species in 'The Fishes of India', Hora (1920-1956) notable contribution on the Indian freshwater fish. Some of the notable studies on fish taxonomy from the Uttarakhand region include the description of Fish fauna of Dehradun. Hora and Mukerjee (1936), Lal and Chatterjee (1962), Singh (1964), Grover (1971), Grover et.al. (1994) and Rauthan and Chalotra (2017).

(b) Habit and Habitat

Present observations on the fish have been carried out in Song river at Raiwala, Nepali Farm and Chhidarwala in the eastern Doon Valley. Field studies on the fish have been made on every 15 days. The fish is one of the commonest and well known for its hardness. It occurs in the middle and upper strata of waters of the Song river. It also prefers to live in stagnant water area to *Puntius sophore*. The fish moves in sunlight and ample space for swimming as well as dense aquatic plants, which occasional hiding places. The two spotted barbs is peaceful, skilful swimmer and lives in swarms.

(c) Food and Feeding Habit

According to Nikolsky(1963) fishes may be divided into three groups on the basis of the character of the food they consume. They are herbivorous and detritophagic, carnivorous and predators. Das and Moitra (1963) have described the food and feeding habits of 26 species of freshwater fishes of U.P. and then into three primary group viz. herbivorous, omnivorous and carnivorous in the basis of then actual dietary habits, depending on the percentage of animal and vegetable food consumed by the fishes. According to Nikolsky (1963) on the basis of the amount of variation in the types of food consumed fishes may be classified as Euryphagic (feeding on a virets of food), Stenophagic (feeding on a few different types of food) and Monophagic (feeding on only single type of food).

Quantitative estimation of food was made by Pearse's (1915) method. If feed on debris, higher plants, matter, insect, mites, diatoms i.e. Ceratonesis, Amphora, Calonesi, Fragllaria, Naviculla, Synedra, Diatoms, Gomphonema, Pinnularia, Melosira, Tabellaria, Denticulas, Cymbella and Cyclotella. (Rauthan and Chalotra 2014).

It is omnivorous, the fish species feed and more on animal food Lumricus, Nemetoda, Cerdina sps., Eubranchipus sps., Paratephusa nypha (beatis sps., iron sps., heptagenis sps., epsorum sps.). Nympus (Gomphida, Cordulegastridee) larval (Dinarthrum sps., Glosesoseme sps., Leptocella sps., Limnophilus sps.), Himiptera (Gerridael, Gerris sps.) than plant food.

Insect availability as food of these fishes is lowest during December, January, July and August and highest during October and November. The algae and diatoms are found in large quantities in summer season.

(d) Breeding Period and Behaviour

In fishery biology the study of breeding habits, breeding period and place is very important. The spawning seasons and places of fish differ considerably from species to species and place to place and have been investigated by a number of works. Bhatnagar (1964), Bhatnagar et.al. (1977), Batola and Singh (1984) given information of the breeding habits of hill stream fishes of the Central Himalaya.

Based on the present observations it is clear that most of the fish of Song river breed in the May to July and December to January. Bhatnagar (1964) in his studies of Bhakra reservoir fishes has reported that *Schizothorax plagiostomus* breeds in July – August and December – January and described the spawning of *Labeo dero*, *L. dyocheilus*, *Barilius bendelisis*, *B. vagra* and *B. barna* also found to breed in shallow pockets of clear water (Badola and Singh 1984). According to Khanna (1958) the presence of flood water in the breeding ground and a current of moderate intensity were most essential for breeding and increase pH did not to be seem to be necessary for fish breeding on the basis of this study it may stated that a suitable temperature was also to necessary for the breeding.

Breeding is an important physiological function performed by all living organisms. Hill streams fishes live under rigorous condition of the fast flowing streams and have to face large number of difficulties in keeping progeny intact. There are many problems involved in the breeding and upbringing of their young ones together with getting the proper type of reproductive impulse at the right time. The maturity of gonads is invariably connected with the spawning impulse in these fishes. Majority of them get this impulse during the rainy season, where the temperature and other conditions to the streams are found most congenial by them. The breeding takes place in early spring (March-April). The pairs separate from a school which generally comprise of 10 to 15 individuals. The males web the females with vivacious, somewhat dancing movements spreading their fins open vibrating them in peculiar manner. Often the males muzzie their females in the region of genital opening. Temporarily the mating games are substituted by violent chasing, sometimes very high speed of spawning is reached. During spawning period the male shows a brownish red sheen. The act of spawning generally takes place under the morning sun. It is preceded by a number of false mating. Then suddenly a male schoots forth from chase to the side of the female. Some sort of contact takes place, a rule among the plants, but sometimes also in open water. With a sudden violent motion in which the fish frequently repeal each other, or whirl around each other, the eggs are expelled and fertilized. The fertilized eggs are scattered far by the violent movement of water and sink to the bottom of the shallow waters, where the parent take care of the eggs. Generally the eggs are of the size of a grain of millet. Each mating releases 20 to 30 eggs to a total of several hundred, depending upon the size and eggs of individual female. The complete act of spawning lasts for several hours.

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New Record Of *Suncus etruscus* (savi, 1822), The Pygmy White-toothed Shrew (soricidae: Soricomorpha: Mammalia) From Madhya Pradesh, India With Notes On Systematics, Status Of Records And Distribution

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ABSTRACT

The present communication deals with the new record of *Suncus etruscus* (Savi, 1822), the Pygmy White-toothed Shrew, from Madhya Pradesh and the status of its earlier 'records' from the state and other aspects in detail.

Key Words: *Suncus etruscus*, Pygmy White-toothed Shrew, Madhya Pradesh wildlifeMamalia

INTRODUCTION

Suncus etruscus (Savi, 1822) is a small-sized slender (not truncated) shrew with short, soft, dense and velvety fur; head relatively large, with a long and mobile proboscis (Figure 1); usually having 30 teeth (upper teeth 18), 4th upper premolar (unicuspid) tooth is very small; ears relatively large, protuberant; sides of mouth with a dense array of short whiskers; hind limbs relatively small. Body usually pale brown or brown to grey shades or deep rusty brown above and lighter or silvery brown or light grey ventrally. Head and body length in the range of 30-56 mm, tail longer than half of body length, 24-32 mm; body mass / weight 1.2-2.7 gm, usually about 1.8 gm. on an average. It is classified under order Soricomorpha, Family Soricidae and subfamily Crocidurinae of class Mammalia. Geographically it is widely distributed in Ethiopian, Oriental and Palearctic region (Hutterer, 2005).

Hodgson (1845), Blyth (1855), Anderson (1877) and Blanford (1888-1891) have worked out several species of shrews, which in many cases are based on single specimen and it has created confusion on their identity / nomenclature. In view of this, Lindsay (1929) studied shrew specimen collection received from Mammal surveys of British India carried out by Bombay Natural History Society, Mumbai and reviewed Indian shrew fauna and removed many confusions. As regards *Suncus etruscus*, no material of this species (including present day synonyms of *S. etrusus* viz., *micronyx, nudipes, nitidofulvus, perrotteti and pygmaeoides*) was studied by her from Central India / Madhya Predesh, except for widely distributed *S. stoliczkanus* from Gwalior, Hoshangabad and Nimar. Ellerman & Morrison- Scott (1951), while dealing Palaearctic and Indian Mammals, listed various subspecies (viz. *etruscus, perrotteti, micronyx, nudipes, nitidofulvus, pygmaeoides* and *fellowesgordoni*) under *S. etruscus* with their distribution but none from Madhya Pradesh; *S. fellowesgordoni* Phillips (1932) from Sri Lanka has been elevated to species level. Corbet & Hill (1992) also didn't report *S. etruscus* from Central India. However, Pradhan (2005) reported collection record of the species from Melghat Tiger Reserve, Maharashtra, which is close to Betul and Burhanpur (erstwhile East Nimar) districts of Madhya Pradesh. Hutterer, 2005 synonymized above mentioned subspecies (excluding *fellowesgordoni*) described under *Suncus etruscus* (Savi) from Indian region and same was followed by Pradhan & Talmale (2012a).

However, the mammalian fauna of Madhya Pradesh and around has attracted the attention

of various workers during the past (Brander, 1923, Morris, 1925, Khajuria, 1981; Khajuria and Ghoshal, 1981; Ghose, 1995; Ghose and Bhattacharaya, 1995; Kushwah and Kumar, 1999; Harshey and Chandra, 2001, 2007, 2008) but no authentic occurrence record of *Suncus etruscus* (Savi, 1822) or its synonyms is available. Khajuria and Ghoshal (1981) recorded as *Suncus etruscus nitidofulvas* Anderson based on a single specimen, a female, from Garha, Jabalpur City collected on 07.ix.1965 (Registration number not given in the paper) with measurements Head and body 76, Tail 47, Hind foot 11.5 and Ear 9 mm. The measurements of this specimen does not agree with this species as it is much smaller in size (Head+ body 36-56, Tail 21-30, Hind foot 5.7-7.9, skull 12.0-13.1 mm vide Vogel, 1999 and others, see synonymy and Table 1) but to *S. stoliczkanus*. Later, Ghose and Bhattacharaya (1995), while working on Kanha Tiger Reserve, sighted (not collected) two specimens under a stone near Supkhar, Balaghat district and identified it as *Suncus etruscus perrotteti* (Duvernoy) which is not possible without data. Then, Kushwah and Kumar (1999) mentioned 'possibly' *Suncus etruscus* from Bandhavgarh National Park / Tiger Reserve (Shahdol and Jabalpur dists.) and Satpura National Park (Hoshangabad dist.), Madhya Pradesh and Indravati National Park / Tiger Reserve (Bastar dist.), Chhatisgarh, again without any data. Harshey and Chandra (2001,2007) dealt with mammals of Madhya Pradesh and Chhatisgarh and they, while working on mammals of the state and Jabalpur district (Harshey and Chandra, 2008), reported as *Suncus etruscus perrotteti* and *Suncus etruscus nitidofulvus*, respectively, basing the same specimen from Garha, Jabalpur City of Khajuria and Ghoshal (1981), mentioning 'very rare in the state' and 'very rare not seen recently' under the said taxa which is again controversial in itself for naming same specimen as two different subspecies. This contention is supported on its non-occurrence (till date) in the state by Chakraborty et al., (2004), who have not shown the distribution of this species in Madhya Pradesh but that of *S. stoliczkanus* in the state.

Recently two specimens of a shrew were collected from Chhatarpur district of Bundelkhand Division by one of the authors (HJH) and another from Chhindwara district, Jabalpur Division in Madhya Pradesh by (SST), which on study are found to belong to *Suncus etruscus* (Savi, 1822), the Pygmy white-toothed Shrew as per its measurements (Head+body 30, 45, Tail 25, 25, Hind-foot 7.5, 7.0, Ear 4.5, 4.0 respectively). Present paper reports first authentic record of *Suncus etruscus* (Savi) from Madhya Pradesh with comments on its earlier records from the state (Map 1).

MATERIAL AND METHODS

Material Examined: I ex. (head+body 30, tail 25, hind-foot, 8, ear 5 mm), female, from under small stones in Buxawha Forest (24°21'33.2" N Lat. and 79°21'32.8" E Long.), District Chhatarpur, Bundelkhand Division, Madhya Pradesh; Date / Time 20.vii. 2011 / 9.40 A. M.; Coll. H. J. Husain (live specimen studied and released in the field).

1ex. (head+body 45, tail 25, hind-foot 7, ear 4 mm, skull not taken out), sex not determined, from Dhad river area (22°24.571' N Lat. and E. 078°36.466' E Long.; altitude 1803 ft), District Chhindwara, Madhya Pradesh, Date / Time 01.x.2012 / 10.30 A. M., Coll. S.S. Talmale, Regd. No. ZSI / CZRC, Jabalpur (Madhya Pradesh) V/ 6125. The specimen was found dead and infested with dipteran larvae. Colour dark gray above and light ashy gray ventrum, same in the case of tail. Tail shorter around 55% of Head and Body length. Vibrissae on tail present. Ear with small hairs not naked.

First specimen (Figure 1 A, B & C) was collected from Buxawha Forest area of Chhatarpur District. The district is located at 24.06° & 25.20°N Lat., 78.59° & 80.26° E Long., respectively, bounded by Uttar Pradesh state to the north and the Madhya Pradesh districts of

Panna to the east, Damoh to the south, Sagar to the southwest and Tikamgarh to the west. It is a part of Bundelkhand Division, Madhya Pradesh. The climate of the day when the specimen collected (Date/Time: 20.vii. 2011 at 9.40 A. M.) was cloudy with Temperature 27.2° Celsius, Relative Humidity: 85.3 %; Rain Fall: 0.5 mm. The region largely consists of mixed deciduous forests of dry type but there is substantial inminglinging of *Harwickia binata* (the Anjan), *Tectona grandis* (the Teak), *Butea monosperma* (the Palas) and varieties of *Terminalias*, *Anogeissus*, *Acacia* etc. with ground vegetation, mostly of Poaceae and Acanthaceae and grasses of genus *Eragrostis*, particularly *E. visscosa*.

Second specimen was collected from Dhad river area, Chhindwara District. The district located on the South-West region of 'Satpura Range of Mountains', spread from 21.28° to 22.49° N Long. and 78.40° to 79.24° E; bound by plains of Nagpur District (Maharashtra), on the South, Hoshangabad and Narsinghpur Districts on the North, Betul District on the West and Seoni Districts on the East. The climate has a subtropical climate, like most of north India having a hot dry summer (April–June) followed by monsoon rains (July–September) and a cool and relatively dry winter; average annual rainfall is 1,183 mm; minimum temperature during winter 4 - 6° Celsius while maximum temperature during summer 38 to 42° Celsius. Around 4212.556 km2 area of the district is covered under forest. Bamboo, Teak, Harra, Saalbeej, Tendu Patta are the major forest wealth mostly of dry deciduous forest type. The climate on the collection day (Date / Time 01.x.2012 / 10.30 A. M.) was cloudy and observed heavy rain in the afternoon.

Measurements of the specimens were taken with help of Vernier callipers (dial graduation upto 0.05mm). All the measurements are given in milimeter (mm). Specimens identified as *Suncus etruscus* (Savi), commnly known as Etruscan Shrew, Etruscus Pygmy Shrew, Savi's Pygmy Shrew, White-toothed Pygmy Shrew with the help of key given by Corbet and Hill (1992).

Bio-ecology : It occurs up to 3,000 m asl and prefer abandoned groves, cultivated areas with shrubs, gardens, scrub, open forests, crevices of old walls as shelter, preferring warm and damp climates. Molur et al. (2005) found it also close to houses and other buildings as has been seen in the present study. However, it avoids sandy areas, dense forests and intensively cultivated land (Libois and Fons, 1999; Palomo and Gisbert, 2002). It is more active during night than the day time . It feeds on invertebrates, mostly insects (ants and other small insects) and mealworms and crickets (in captivity) (Figure 1C shows shrew feeding on grasshopper) and also on small vertebrates, consuming about 1.5-2.9 times its own body weight per day. Breeds all year round but mostly between October and December with gestation period of about 28 (av. 27) days as per anecdotal information and have 2-6 (av. 4) cubs per litter are born. As per the records, life-span about two years. Little known as it is hard to keep alive in captivity due to their size and their large energy requirements (Nowak, 1990).

RESULTS AND DISCUSSION

In Madhya Pradesh it, as stated, has been reported by Khajuria and Ghoshal (1981) and Harshey and Chandra (2007, 2008), Ghose and Bhattacharaya (1995) from Jabalpur City and Kanha National Park / Tiger Reserve (Balaghat Dist.,MP) respectively under two different subspecies, viz. *perrotteti* and *nitidofulvas* which is not very much convincing as these could not exist in almost the same area. However, Kushwah and Kumar (1999) didn't go into subspecific level and mentioned the possibility of the occurrence of *Suncus etruscus* from Bandhavgarh National Park / Tiger Reserve (Umaria and Shahdol dists., MP), Satpura National Park (Hoshangabad dist.,MP) and Indravati National Park / Tiger Reserve (Bastar dist., MP, now in Chhatisgarh State), these authors didn't collect or sighted any specimen of the species from the area.

Synonyms of *Suncus etruscus* (Savi) following Hutterer (2005) and measurements of the taxa which were described from Indian region:

Sorex pachyurus Kuster, 1835. *Isis* (*Oken*), 77: Cagliari, Sardinia (a region of Italy).

Sorex perrotteti Duvernoy, 1842, *Mag. Zool. Paris*: 29, Nigiri Hills at 2300 m, South India. 1ex., male, head+body 37, tail 34, hind-foot 8 mm. [*Suncus perrotteti*, Lindsay, 1929. *J. Bombay nat. Hist. Soc*., 33(2): 226-340: Bellary (4 specimens) and Coorg (2 specimens). One specimen found with 4 young (No. 1456) from Vijayanagar, Bellary: head+body 49, tail 35, hind-foot 8, ear 6; av. of five adult specimens: head+body 48.2, tail 32.8, hind-foot 8, ear 6.1 mm.][*Suncus etruscus perrotteti*, Ellerman & Morrison-Scott,1951. *Checklist of Palaearctic and Indian Mammals 1758 to 1946*, London: 66 (Range: Nilgiri Hills, Coorg, Bellary etc., in Southern India)]

Sorex pygmaeus Hodgson, 1845. *Annals and Magazine of Natural History, [ser. 1]*, **15**:269, Nepal. Head+body less than 50mm, tail 29.96, Hind-foot 9.39 synonymised under *Suncus pygamaeoides* Anderson by Lindsay (1929).

Sorex micronyx Blyth, 1855. *J. Asiat. Soc. Beng*., 24: 33, Landour, in Dehra Dun district, United Provinces, Northern India. Type specimen No. 258 B of his Catalogue (No. 2406 of Cat. Mamm. Ind. Mus): Head+body 41.0, tail 28.0, hind-foot 10, skull 12.5 mm.-[*Suncus micronyx*, Lindsay, 1929. *J. Bombay nat. Hist. Soc.,* 33(2): 226-240: 1 adult male specimen (No. 4168) from Ramnagar, 30 miles W. of Nainital on way to Masuri. Head+body 41, tail 32, hind-foot 8, ear 6, skull 12 mm; 1 specimen (No. 3066) from Dhamtal, Kangra: head+body 52, tail 31, hind-foot 8, ear 6 mm, no skull.][*Suncus etruscus micronyx*, Ellerman & Morrison-Scott, 1951. *Checklist of Palaearctic and Indian Mammals 1758 to 1946*, London: 66 (Range: Kumaon and probably Kangra, Punjab)]

Sorex melanodon Blyth, 1855 *J. Asiat. Soc. Beng*., 24: 33, head+body 45.96, tail 25.9, hind-foot 7.87, ear 4.5 mm synonymised under *Suncus nitidofulvus* by Lindsay (1929)

Sorex nudipes Blyth, 1855. *J Asiat. Soc. Beng*., 24: 34, from Amhurst,Tennaserim, Burma. Head+body 43.0, tail 27, hind-foot 8.5 mm. Blyth's Type specimen are No. 254 A-E of his Catalogue and Nos. 234 A-E of *Cat. Mamm. Ind. Mus*. [*Suncus nudipes*, Lindsay, 1929. *J. Bombay nat. Hist. Soc*., 33(2): 326-340, Jaintia Hills, Assam (3 specimens), 1 adult from Tennaserim, 1 juvenile from Hsipaw, Shan States. Av. of 4 adults: head+body 48, tail 30.5, hind-foot 8.5, ear 6; 1 male specimen (No. 829) from Shangpung, Jaintia Hills: head+body 45, tail 36, hind-foot 8, ear 6 mm.][*Suncuas etruscus nudipes*, Ellerman & Morrison-Scott, 1951. *Checklist of Palaearctic and Indian Mammals 1758 to 1946*, London: 66 (Range includes Jaintia Hills, Assam and Shan States, Burma).]

Sorex atratus Blyth, 1855. *J. Asiat. Soc. Beng*., 24: 34, Cherrapunji, Khasi Hills, Assam.
Head (Cut); Tail 25.40, hind-foot 8.38 mm.

Sorex hodgsoni Blyth, 1855. *J. Asiat. Soc. Beng*., 24: 34, Darjeeling, Female, head+body 38.08, tail 25.39, hind-foot 8.63, synonymised under *Suncus nitidofulvus* by Lindsay (1929)

Cricidura suaveolens Blasius, 1857. *Saugeth. Deutschlands*, 147 (not of Pallas, 1811).

Pachyura assamensis Anderson, 1873. *Proc. Zool. Soc. London*, 234: Goalparoh on

Brahmaputra. Head+body 40.13, tail 25.4, hind-foot 7.87, ear 4.1mm.

Crocidura (*Pachyura*) *nitidofulva* Anderson, 1877. *J. Asiat. Soc. Beng*., XLVI: 272, Lower Bengal (Calcutta) and the valley of Brahmaputra to Goalpara. Female (No. 234 of Cat. Mamm. Ind. Mus.): head+body 45, tail 27, hind-foot 8, ear 4.5 mm. (adolescent, adult female: 42.42, 45.72, tail 27, 27.43, 27.67; hind-foot 8.13, 8.13, ear 4.83, 4.57 mm, from Annandale, 1877: 272). [*Suncus nitidofulvus*, Lindsay, 1929. *J. Bombay nat. Hist. Soc.*, 33(2): 226-240: Luia, Chaibassa (Bihar and Orissa): Av. of 10 specimens-head+body 48.6, tail 37, hind-foot 9, ear 6.3 mm.][*Suncus etruscus nitidofulvus*, Ellerman & Morrison-Scott, 1951. *Checklist of Palaearctic and Indian Mammals 1758 to 1946*, London: 67 (Range: Chaibassa, Orissa, India)].

Crocidura (*Pachyura*) *nilagirica* Anderson, 1877. *J.Asiat. Soc. Beng*., XLVI: 274, Ootacamund, Nilgiri Hills, Southern India. Male: head-body 45.21, tail 28.45, hind-foot 8.89, ear 3.81 mm.

Crocidura (*Pachyura*) *travancorensis* Anderson, 1877. *J. Asiat. Soc. Beng*., XLVI: 275-76, Travancore, India. Head+body 42.16, tail 30.23, hind-foot 7.87, ear 4.83 mm.

Crocidura (*Pachyura*) *pygmaeoides* Anderson, 1877. *J. Asiat. Soc. Beng*., XLVI: 279-80, Hasimara, Bhutan Duars and Darjiling District, Himalayas. Head+body, 46.25, tail 35.0, hind-foot 9.2, ear 5.0 mm (by Anderson, 1877). Head+body 46.99, tail 35.56, hind-foot 9.40, ear 5.08 mm (Anderson, 1877: 279-280).-[*Suncus pygamaeoides*, Lindsay, 1929. *J. Bombay nat. Hist. Soc*., 33(2): 326-340: Himalayan slopes: specimen No. 936 from Pashok, Darjiling: head+body 46, tail 35, hind-foot 9, ear 5 mm.][*Suncus etruscus pygmaeoides*, Ellerman & Morrison-Scott, 1951. *Checklist of Palaearctic and Indian Mammals 1758 to 1946*, London: 67 (Range: Darjeeling district, North-Eastern India)]

Crocidura (*Pachyura*) *macrotis* Anderson, 1877. *J. Asiat. Soc. Beng.,* XLVI: 271-72, Tenaserim, Thailand. Head+body 44.45, tail 32.26, hind-foot 8.64, ear 5.08 mm.

Crocidura nanula Stroganov, 1941. *C.R. Acad. Sci. U.R.S.S.* 33- 272.

Suncus etruscus bactrianus Stroganov, 1958. Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSSR, 1 : 122-125 (in Russian).

Podihik kura Deraniyagala, 1958: 5, Kandulu R, Madirigiriya, N-C Province, Sri Lanka synonymized under *Suncus etruscus* by Hutterer, 2005.

EARLIER RECORDS AS *SUNCUS ETRUSCUS NITIDOFULVUS, S. ETRUSCUS PERROTTETI* AND *SUNUS ETRUSCUS* FROM MADHYA PRADESH AND THEIR STATUS

1. Khajuria and Ghoshal (1981): as *Suncus etruscus nitidofulvas*, 1ex., female, from Garha, Jabalpur City, 07.ix.1965; Head and body 76, tail 47, hind-foot 11.5, ear 9 mm = *Suncus stoliczkanus* as per the measurements.
2. Ghose and Bhattacharaya (1995): sighted (not collected) two specimens under a stone near Supkhar, Kanha Tiger Reserve (Balaghat dist., MP) and reported as *Suncus etruscus perrotteti* which is not well based = could be *Suncus stoliczkanus*.
3. Kushwah and Kumar (1999): mentioned 'possibly' as *Suncus etruscus* from Bandhavgarh National Park (Umaria & Shahdol dists., MP), Indravati National Park (Bastar dist. CG)

and Satpura National Park (Hoshangabad dist., MP). The same way, these authors mentioned the possibility of *S. stoliczkanus* also from SNP (Hoshangabad dist, MP) and Madhav National Park (Shivpuri dist., MP), not collected or sighted and hence the report appear basing on 'possibility'and not on actual collection which cannot be taken into account as *S. etruscus* on mere speculation.

4. Harshey & Chandra (2007): as *Suncus etruscus perrotteti*, 1 ex., from Garha, Jabalpur City (MP), 07. ix. 1965, Coll. M. L. Koshta; mentioning 'very rare in the state' (same specimen as of Khajuria & Ghoshal, 1981) = *Suncus stoliczkanus*, being based on Khajuria & Ghoshal's (1981) specimen.
5. Harshey & Chandra (2008): as *Suncus etruscus nitidofulvus*, from Garha, Jabalpur City (MP), 07. ix. 1965, Coll. M. L. Koshta; mentioning 'very rare, not seen recently' (same specimen as of Khajuria & Ghosh (1981) = *Suncus stoliczkanus*, being based on Khajuria and Ghoshal's (1981) specimen.

The subspecific identity of this species appear in controversy as it has been reported as *S. etruscus nitidofulvus* (Anderson, 1877) and *Suncus etruscus perrotteti* (Duvernoy, 1842) both from the same or adjoining area (in Madhya Pradesh) and hence it is dealt here as *Suncus etruscus* (Savi, 1822) till more material is collected / procured and studied from the area. The distribution of the species in India is as per the specimens recorded (synonyms given above) from the different states : Assam (Goalpara), Chhatisgarh (possibly as per Kushwah & Kumar, 1999), Himachal Pradesh (probably Kangra vide Ellerman & Morrison-Scott, 1951), Jharkhand (Chaibasa, West Singhbhum dist.), Karnataka, Kerala, Madhya Pradesh (new record as above), Maghalaya (Cherrapunji, Jaintia Hills), Maharashtra (Pradhan and Talmale, 2012b), Manipur, Punjab, Sikkim, Uttarakhand, West Bengal.

Conservation Status : IUCN Red List: Least Concern (Aulagnier et al., 2008); CAMP: Least Concern (Nationally and Globally) (Molur et al., 2005). The shrew is relatively rarely seen in the field. The largest threat originates from human activities, particularly destruction of their nesting grounds and habitats as a result of farming. Also sensitive to weather changes, such as cold winters and dry periods. Major predators are birds of prey, especially the owls (Talmale and Pradhan, 2009).

On the above discussion it concludes that all the earlier reports of *Suncus etruscus* (Savi) from Madhya Pradesh are only on the basis of Khajuria and Ghosh (1981). But the measurements of the specimen they reports matches with the *Suncus stoliczkanus* (Anderson). Therefore, the present specimen collection records confirms first authentic records from Madhya Pradesh. It is also necessary extensive surveys of the area to collect more fresh specimens for revisionary taxonomic studies upto subspecific level.

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Map 1. Showing collection localities of *Suncus etruscus* (Savi) from Madhya Pradesh (Map Source: Google Earth, 2013).

Table 1: Differences between *Suncus etruscus* and *S. stoliczkanus* by many workers and their comparison with Khajuria & Ghoshal (1981)'s specimen from Garha, Jabalpur, Madhya Pradesh. (All measurements are given in milimeter)

Sl. No.	Character	*S. etruscus* (including synonyms)	*S. stoliczkanus*	Remarks: specimen of Khajuria & Ghoshal, (1981).
1.	Head + body	30.0, 45.0 (present record), 37.0 (Dhuvernoy, 1844), 46.0 (Dhuvernoy, 1845), 41.0, 43.0 (Blyth, 1855), 42. 16, 42.42, 44.45, 45.0, 45.21, 45.72, 6.25, 46.99 (Anderson, 1877), 41.0, 45.0, 46,0, av. 48.0, av. 48.2, av. 48.6, 49.0, 52.0 (Lindsay (1929), 35.0-55.0 (Corbet & Hill, 1992), 35.0-50.0 (Stone, 1995), 36.0-58.0, (Vogel, 1999)	63.0 (Anderson, 1877), Av. 73.0, 75.0 (Lindsay, 1929), 60-80 (Corbet & Hill, 1992)	76.0 Khajuria & Ghoshal, (1981)
2.	Tail	25.0 (present record) 34.0 (Dhuvernoy, 1844), 35.0 (Dhuvernoy, 1845), 27.0, 28.0 (Blyth, 1855), 27.0, 27.43, 28.45, 30.23, 32.26, 35.0, 35.56 (Anderson, 1877), 30.0, av. 30.5, 31.0, 32.0, av. 32.8, 35.0, 36.0, av. 37.0 (Lindsay, 1929), 24-32 (Corbet & Hill, 1992), 25.0-30.0 (Stone, 1995), 21-30 (Vogel, 2004)	48.0 (Andrson, 1877), av. 48.0, 48.0 (Lindsay, 1929), 37.0-50.0 (Corbet & Hill 1992,)	47.0 (Khajuria & Ghoshal, 1981)
3.	Tail as % of head+body	48-75 (Corbet & Hill, 1992)	c. 60 (Corbet & Hill, 1992), 50.0-70.0 (Stone, 1995)	-
4.	Hind-foot	7.0, 8.5 (present record), 8.0 (Dhuvernoy, 1842), 8.5, 10.0 (Blyth, 1855), 7.87, 8.0, 8.13, 8.64, 8.89, 9.2, 9.40 (Anderson, 1877), 8.0, av. 8.0, av. 8.5, 9.0 (Lindsay, 1929), 7.0-9.5 (Corbet & Hill, 1992),5.7-7.9 (Vogel, 2004)	12.0 (Anderson, 1877), av.11.8, 11.0 (Lindsay, 1929), 11.0-14.0 (Corbet & Hill, 1992)	11.5 (Khajuria & Ghoshal, 1981)
5.	Ear	4.0, 5.0 (present record), 3.81, 4.5, 4.57, 4.83, 5.0, 5.08, (Anderson, 1877), 5.0, av. 6.0, 6.1, av. 6.3 (Lindsay, 1829)	8.0 (Anderson, 977), av. 9.0, 9.0 Lindsay, 1929),	-
6.	Skull length	12.5 (Blyth, 1855), 12.0 (Lindsay, 1929), 13.7-14.7 (Corbet & Hill, 1992), 12.0- 13.1 (Vogel, 2004)	20.0-23.0 (Corbet & Hill, 1992)	-
7.	Upper teeth-row	5.3-6.4 (Corbet & Hill, 1992)	8.7-10.1(Corbet & Hill, 1992)	-
8.	1st upper uncuspid With anterior cusp	+ / 0 (Corbet & Hill, 1992)	0 (Corbet & Hill, 1992)	-
9.	Number of cusps On upper edge	0 (Corbet & Hill, 1992)	0 (Corbet & Hill, 1992)	-
10.	Dorsal pledge	Medium to Dark brown (Corbet & Hill, 1992), Varies from grayish-brown to dark brown (Stone, 1995)	Dull brown (Lindsay, 1929), Light / medium Grey-brown (Corbet & Hill, 1992), yellow around throat or pectoral region not always eviden (Stone, 1995)	-
11.	Vibrissae on tail	+ (Corbet & Hill, 1992)	+ (Corbet & Hill, 1992)	-
12.	Weight in gms	2.5 (Stone, 1995)	-	-
13.	Range	Widespread (Corbet & Hill,1992; Stone, 1995)	Gwalior and Central India (Lindsay, 1929), India & Pakistan (Corbet & Hill,1992), Pakistan, India, Nepal & Bangladesh (Stone, 1995)	-

Figure 1 A,B,C : *Suncus etruscus* (Savi) specimen collected from Buxawha Forest area of Chhatarpur District, Madhya Pradesh.

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Former Scientist-E / Joint Director, Zoological Survey of India, having vast field and research experience since 1964 (still continuing at my own), on various animal groups with good number of publications in journals/books of repute, higher research guide leading to Ph.D., Environmental Impact Assessment studies, member editorial board of various Journals, review of scientific papers from India and abroad and teaching. Described many new fish species, adding to science. Attended various seminars / symposia. Participated in Antarctic Expedition for zoological studies. Worked on Mauritius and Arabian fauna also. Awards: Merit Promotion at Zoological Survey of India and 'Special Honour' for scientific studies at Antarctica and 'Appreciation Certificate' for outstanding achievement by Vice Chancellor, Aligarh Muslim University.

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Food And Feeding Habits of *Labeo bata* (Ham) From River Ghaghra In Lakhimpur Kheri

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Abstract

The food of *L. bata* (Ham.) consists chiefly of phytoplankton (green algae, diatoms, blue green algae, desmids, phytoflagellates, algal spores and zygotes), macro-vegetation and decayed organic matter (*Seston*). Zooplanktons are very rare in the diet of the adult fishes. However, zooplanktons are the main food of fingerlings and as the fish grow, they change their feeding habits from zooplankton to phytoplankton. Green algae and diatoms were the most important food items and constituted about 35.4% of the total food. The stomachs of all the fishes contained sand particles which were ingested while feeding at the bottom.

The intensity of feeding was found to be maximum during post-monsoon (October-November) and winter months (December-February) and low during post-winter (March-April), summer (May and June) and monsoon months (July-August). An increase in the feeding intensity of the fish during winter seems to be related to the availability of the algal bloom in the aquatic environment in which the fish lives and during the season when the flood water carries a lot of silt and plankton production is greatly decreased. The feeding intensity is also reduced owing to the scarcity of the food. Besides, the gonadal maturation also affects the feeding intensity of the fish as minimum food intake was found in ripe fishes. No difference was observed between the food of males and females fishes.

Key words: *Labeo bata* , Gastro- Somatic index ,Phytoplanktons.

Introduction

Food being the basic source of energy plays a vital role in the life of fish. The basic functions of an organism – the growth, the development, the reproduction and other energy processes all take place at the expense of the energy, which enters organism in the form of the food. Studies on the food of fish also facilitate an understanding of the causative aspects of biology of the fish such as migration, geographical distribution and population levels. The food and feeding habits in Indian Cyprinids have been reported by Sarabhai (1939); Mookerjee and Ghosh (1945); Alikunhi (1952, 1953, 1957); Das and Moitra (1955a, b); Hora and Pillay (1962); Chitray (1966); Qayyum and Qasim (1964); Vasisht (1960); Bhatnagar and Karamchandani (1970); Khan and Siddiqui (1973) etc. The subject has been reviewed by Jhingran (1966, 1991), Khan and Jhingran (1975), Jhingran and Khan (1979), Chondar (1999) and many others.

Most of the above studies were confined on the study of food and feeding habits of Indian major carps, but comparatively little information is available so far on the food of minor carps. The food and feeding habits of minor carps were dealt by Chacko and Kuriyan (1948); Das and Moitra (1955a, b, 1956); Sinha (1972); *Labeo gonius* by Alikunhi (1957); Hora and Pillay (1962) and Chatterjee *et al*. (1977), Chondar (1999) etc. Scanty information is available on the food and feeding habits of an important minor carp e.g. *Labeo bata* (Alikunhi, 1957; Hora and Pillay, 1962; Chatterjee, 1974; Chatterjee *et al*. 1992; Chondar, 1999). However, the present study was undertaken for the first time to investigate the food and feeding habits of *Labeo bata* from river Ghaghara. Attention has been devoted to food consumption, feeding intensity and seasonal variation of food.

Material And Methods

A total of 300 specimens of *Labeo bata* (70 mm to 415 mm) caught from river Ghaghara

were collected at Dhakherwa fish market. Fish were brought in fresh condition and immediately preserved in 5% formalin. The preserved fish specimens brought to the laboratory were used for food analysis. The total length of the fish was measured up to the nearest mm and its weight up to 0.1 g accuracy. The fishes were sexed and their stages of gonadal maturity were determined following the scheme given by Qayyum and Qasim (1964)..

In the present study, the 'point' method as described by Hynes (1950) has been followed.

The entire alimentary canal was dissected. All gut contents were removed carefully by means of a soft brush into a petridish containing known volume of water. It was then thoroughly mixed and out of this 0.5 ml was taken and transferred into Sedgewick Rafter counting cell. The food items were thoroughly distributed in the counting cell and examined under microscope for detailed study. All food items from each gut were counted from 10 random squares of the counting cell and knowing the number of total squares in a counting cell, total number of each food item could be determined. Each food organism was counted and allotted a point by visual inspection, based on its relative size and number in gut contents (Hynes, 1950; Pillay, 1952). By multiplying numbers of each organism by the points allotted to it, its abundance could be estimated. Taking this as the basis, the different items in the gut contents were converted into percentages in the sample. The percentages of decayed organic matter and sand and mud were decided by eye estimation. The frequency occurrence of each food component was determined by dividing the number of guts containing the food by the total number of guts examined during that period. The number of fishes with empty guts was also recorded in each month and expressed as the percentage of total number of fishes examined in that month.

Observations

Food Composition:

Figs 1 and 2 revealed that the fish subsists mainly on phytoplanktonic organisms. Diatoms, green algae and decayed organic matter were the main food items present in the gut. The fish also fed on zooplankton consisting of protozoans, rotifers and crustaceans. The food items in the gut of the fish were invariably found along with sand and mud. The results indicated the *L. bata* is herbivore fish feeding on bottom dwelling organisms. Fig. 3 and 4 shows the seasonal variations in the percentage composition of food intake of the fish.

Phytoplankton:

Diatoms (Bacillariophyceae):

Diatoms formed the main food item of the fish constituting about 18.60% of the total food (Fig. 4). Diatoms were represented by 8 genera and, on an average, consisted of *Cyclotella* (3.21%), *Diatoma* (3.05%), *Nitzschia* (1.64%), *Naviculla* (5.47%), *Cymbella* (2.10%), *Gyrosigma* (1.22%), *Synedra* (0.98%) and *Surirella* (0.93%).

Green algae (Chlorophyceae)

Green algae were next items of food in order of abundance and recorded, on an average, about 10.89% of the total food items that occurred in the guts of *L. bata*. Green algae were represented by 8 genera: *Oedogonium* (1.15%), *Pediastrum* (1.11%), *Selenastrum* (1.13%), *Ankistrodesmes* (1.95%), *Scendesmes* (0.85%), *Spirogyra* (3.73%), *Crucigenia* (2.77%) and *Tetraspora* (1.73%). The most common being *Spirogyra*, followed by *Crucigenia*, *Ankistrodesmes, Oedogonium,* and *Scenedesmes* showed intermittent occurrence being absent for most of the year. As regards seasonal abundance of green algae, they started increasing from October till December/January, thereafter showing a fluctuation in their abundance and attaining a

peak in the month of May (16%) and April (8.78%) in the year 2006-07 respectively when the bulk of green algae in the sample was represented by *Spirogyra* and *Crucigenia*.

Blue green algae (Myxophyceae):

This group was represented by 4 genera, e.g., *Nostoc* (1.89%), *Anabena* (1.18%), *Microcystis* (2.37%) and *Phormidium* (1.68%) and formed about 7.10% of the total food items. *Phormidium*, *Nostoc* and *Microcystis* were the most common genera.

Sand and Mud

It consisted about 26.5% of the total food items, which were recorded in the gut throughout the year. They formed the bulk of the contents reaching its maximum in June (2.12%) and July (2.67%). No appreciable difference was noted in the food consumption of male and female specimens.

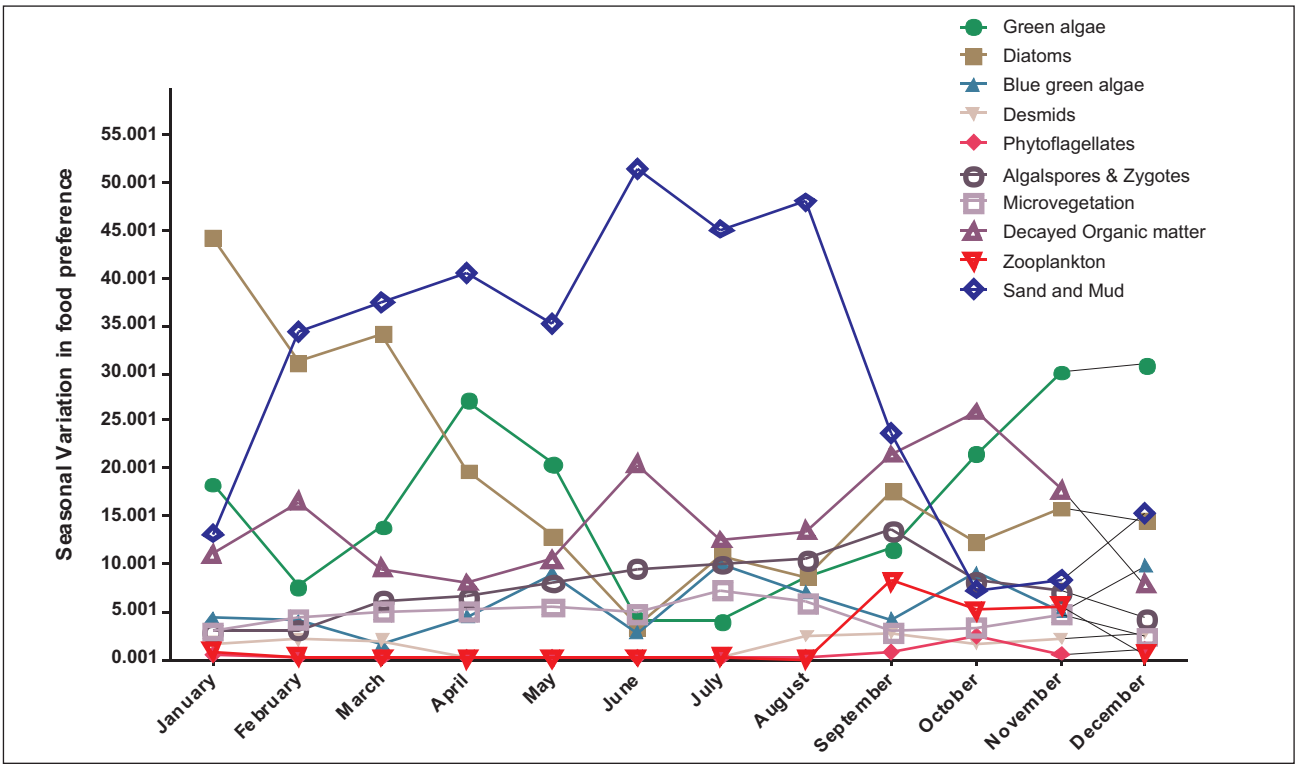

Fig. .1 Monthly Variation in food composition of *Labeo bata* from river Ghaghra (2006).

Intensity of feeding:

The values of gastro-somatic index along with given percentages of empty guts for different months are given in Fig. 3. The figure 3 reveals that the gastro-somatic index of the fish was inversely proportional to the percentage of their empty guts. In females, feeding intensity of the fish was found to be low from April to September, being extremely low during June to August. A pronounced feeding activity was recorded from October to March. In case of male specimens, the same trend of feeding activity was noticed but with a slight variation. In males, feeding intensity was extremely low during June to September, thereafter, an increase in the feeding intensity was observed from October to April. The percentage of empty guts in male specimens, when compared to that in females, showed a gradual increase from April to September, whereas in females, there was an abrupt increase in their percentage from April to August. However, the feeding intensity was higher in males than females. The lower feeding intensity may be attributed to intensive sexual stress of female as compared to that of males.

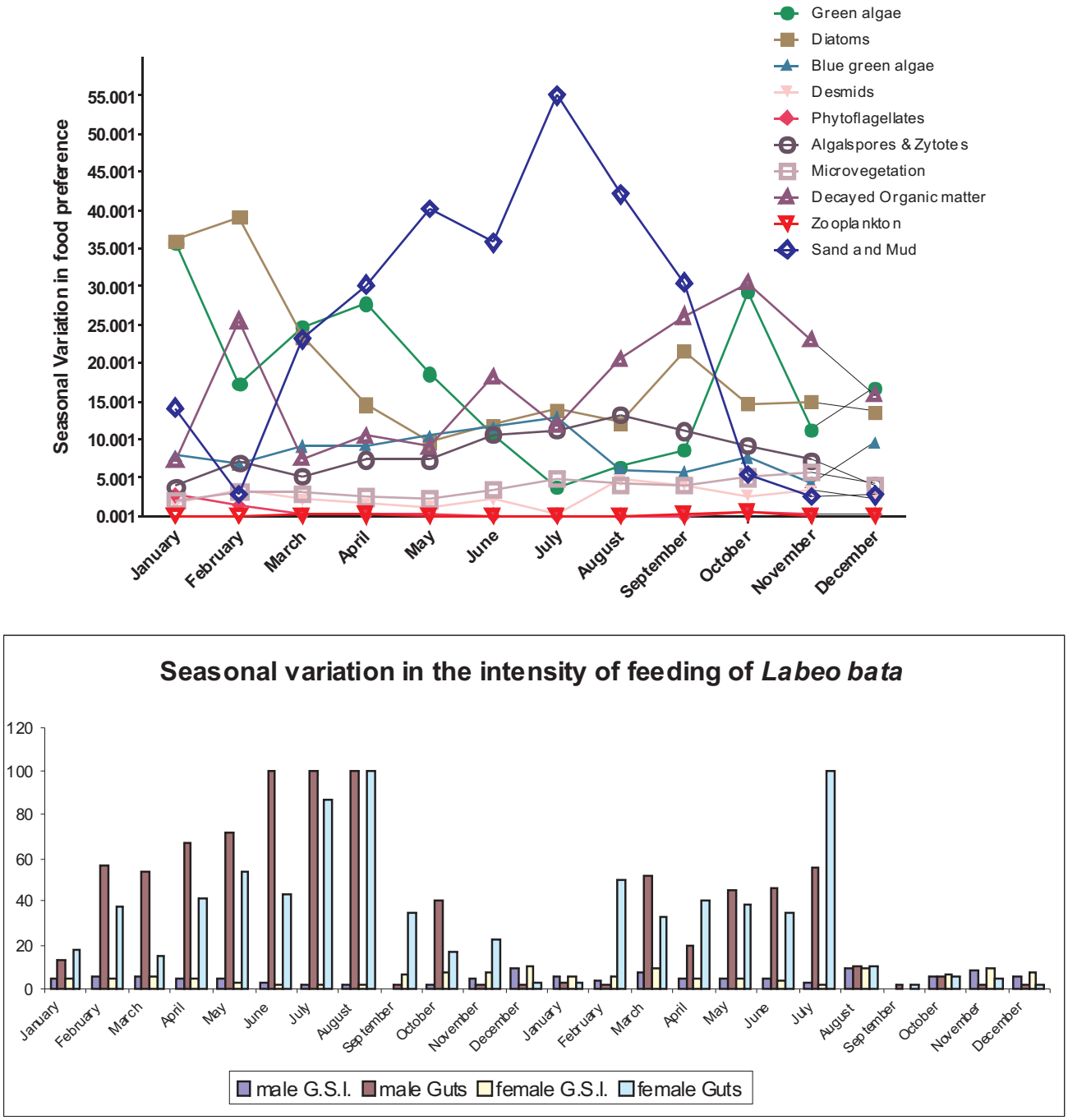

Fig. 3 Seasonal variation in the feeding intensity of *Labeo bata* from river Ghaghra during the year 2006 and 2007.

Discussion And Result

The detailed study on the mode of feeding and structures associated with the digestive system in *Labeo bata* showed the fish to be a phytophagus bottom feeder.

Food composition

The predominant occurrence of green algae, diatoms, blue green algae, desmids, phytoflagellates, algal spores and zygotes and macrovegetation in the gut of *L. bata* strongly suggests that this species feeds mostly on plant matter. It was noted that the fish gorged their gut with fine and soft decayed organic matter, fresh algae, diatoms, along with sand and mud. The herbivorous type of feeding habit is also supported by the structural modification of the organs of feeding. Zooplankton formed a very small proportion of the diet though it forms the main bulk of the food of fingerlings. The occurrence of zooplanktonic organisms such as the rotifers and

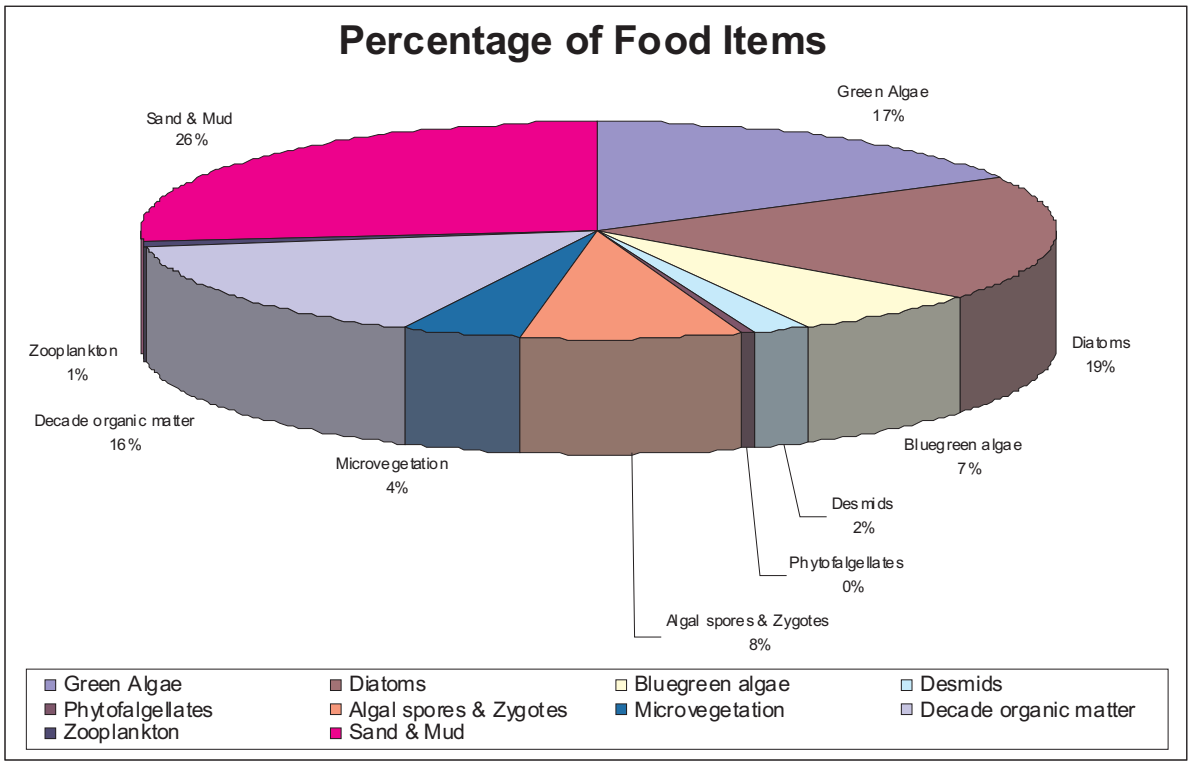

Fig. 4 Selective percentage of different food items in *Labeo bata* from river Ghaghra.

crustaceans in the guts may be accidental. The presence of sand and mud in the gut of these fishes, furnishes evidence about their feeding at the bottom. The appearance of different types of algae in gut contents in different months of the year depends on their availability rather than on selection by the fish. *L. bata* is a non-migratory fish and remains in one habitat throughout its life and has to adapt to the food available in the rivers during different seasons of the year.

The occurrence of phytoplankton in the gut of the fish was recorded throughout the year and its total percentage almost remained the same. If the occurrence of one group was in lesser quantity, it was replaced by another group of phytoplankton. The occurrence of decayed organic matter, detritus (*seston*) in the gut was quite high in monsoon months and the incoming flood water appears to be the main source of organic matter. The percentage of decayed organic was quite low during winters.

Intensity of Feeding

Seasonal variation in intensity of feeding of adult *L. bata* was affected by maturation. Low feeding from March up to June was due to development of gonads and during peak ripeness (June), the minimum feeding took place. Feeding intensity was also low during monsoon months. The rate of food intake increased in the post-monsoon months. This increase in food intake can be associated with the established conditions of the environment when more food becomes available. The spent fishes consume more food to recover from the exhaustion and for gonad building. Almost the same intensity of feeding was observed in both the sexes. The temperature was not found to influence the intake of food.

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Mammalian diversity of Ansupa lake and adjoining forest area of Athagarh Forest Division, Eastern Ghats, India

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Abstract

The sampling of the mammalian vertebrate diversity of Ansupa lake and adjoining forest area of Athgarh forest division has not been studied comprehensive manner. Thus, we conducted study seasonally by using direct searching methods. This survey was conducted in three consecutive seasons mainly post monsoon, winter, and early summer. Altogether, we recorded twenty-six mammalian species belonging to 8 order, 15 families and 23 genera. Carnivore was the dominant order with 11 species belongs to 7 families. Whereas, Insectivora, Proboscidae, and Lagomorpha having leanest diverse order. The distribution of mammalian diversity was more significance in early summer, then winter and in post monsoon respectively. **While 88.46 percent species were randomly distributed and 7.69 percent were aggregated. Shannon-Weiner index showed considerable variation and ranged from 1.164 to 1.192. A details list of mammalian species recorded presented. Out of 26 species two are placed under endangered, two are under vulnerable, one in near threatened and 21 species are placed under least concern category of IUCN red data book. Our current study revealed with the checklist, diversity of mammals, and interlink with the habitats, discussed the threat and focus on long-term conservation of lake.**

***Keywords*:** mammals, carnivores, **diversity indices,** species rank-abundance, freshwater ecosystem, conservation, reserved forests

Introduction

India is bestowed with a rich diversity of wetlands and 4.6% of its land area (National Wetland Atlas, 2011). In Odisha, Ansupa lake is the largest freshwater lake situated on the left side of the river Mahanadi, the biggest river of Odisha and national importance due to its unique biodiversity character and is a famous natural heritage of Odisha. It harbors a large number of birds, fishes, and aquatic plants. Different types of domestic and migratory birds visit the lake in wintertime, attracting a large number of tourists as well as an ornithologist for study.

Although, freshwater habitats show more variety in their physical and chemical characteristic than marine habitats and contain a disproportionately fraction of the world's biodiversity (Subramanian & Jaiswal, 2012). Faunal inventorying is one of the important tasks for precise taxon-specific and area-specific conservation efforts. Its relevance increases manifold in the light of the conspicuous dearth of information about the biodiversity profile of the existing protected area network within the country (Srinivasulu *et al.*, 2004). Therefore mammalian diversity of Ansupa lake and adjoining forest areas has been need to knowing for further conservation of the animals as well as a lake.

Materials and Methods

Study areas: Geographically Ansupa lake is situated between 85-86° longitude East and 20-31' latitude North. It is connected with river Mahanadi, the biggest river of Odisha. The lake is delimited by Saranda hills on its western side, Bishnupur hill on its north-eastern side and by villages, which are predominated by fishermen families. The lake is connected to its southwest side with the river Mahanadi by a channel called Kabula nullah through which floodwaters of river Mahanadi enters into the lake. There is another channel called Hulluhula nala, which has also an opening to Mahanadi acted as the outlet to flush out excess water from the lake. The lake

also used to get water through other sources like Sankana nalla, Khandaka nallah and Kantapahara patta, which are now defunct.

Methodology: Mammalian species were surveyed by both direct and indirect search methods (Varman & Sukumar, 1995). The study was carried out seasonally from post monsoon, winter, and early summer season 2012-13. We collected indirect evidence such as scats, pug/ foot marks, and calls of different mammalian species were searched along existing roads, near the hill, forest patch and also in open areas. Hence the data for each species was presented in terms of signs of occurrence and encounters at a sampling location. A presence of certain species of animals was also ascertained based on information collected from the local villagers. We conducted an active visual search on morning 05.00hr – 10.00 hr and evening 16.30hr – 22.30hr when the animals are more active. The data was collected from session wise is given in (Table 2). The species observed using an Olympus 10X50 DPS I binocular and Nikon L110 camera was used for photography and identification of the species recorded was done with the help of standard literature (Menon, 2003).
Diversity Analysis: Mammalian diversity was computed using two major components mainly alpha diversity and beta diversity were calculated. Measures of diversity widely used Fisher's and Shannon's diversity indices were calculated because it is well accepted that all species at a site within and across systematic groups contributes equally to its biodiversity (Ganeshaiah et al. 1997, Das et al. 2012). For analysis of data Biodiversity-Pro software version, 2 (McAleece et al. 1997) was used.

Results and Discussion

The present study deals with 26 species of mammals belonging to 8 Order and 15 families and 23 genera. The dominant order is Carnivora having 11 species belongs to 7 families, then Rodentia 6 species with having 2 families (Table 1). The Shannon's diversity index indicated that's in early summer species diversity is high (1.192) followed by winter (1.181) and post-monsoon (1.164). The Simpson and Hills indices also revealed almost the same order (Table 2). The distribution of mammal in Ansupa lake and adjoining forest area were assessed and results indicate that 88.46% were randomly distributed and 7.69% were aggregated. The species rank-abundance plot indicated that the early summer is the best period for the mammals (Figure 2). The aggregated species distribution indicated the season preference and random species indicates the available resource use and suitability to survival (Table 2).

Although, wetlands are one of the most productive ecosystems in the world and essential life supporting systems providing a wide array of benefits (Mitsch & Gooselink, 2000). 26 species of mammals has been recorded so far from Ansupa lake. Out of 26 species, two are placed under *Panthera tigris* A2abcd; C1 and *Elephas maximus* A2c of the endangered category, while, *Prionailurus viverrinus* is under vulnerable A2cd+3cd+4cd and *Melursus ursinus* in vulnerable A2c category, one *(Hyaena hyaena)* in near threatened and 21 are placed under least concern category of IUCN red data book.

Over the years due to environmental degradations like the closure of the inlet and outlet mechanism of flow of water, siltation, weed infestation, water quality changes, livestock grazing, public pressure for recreation, overexploitation of aquatic plant resources and pollution were major threats for the conservation of Ansupa lake. Public awareness for sustainable use of wetland resources, ecology, and biological research are inevitable for long-term conservation and management of the lake.

Acknowledgements

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Table 1: Alpha Diversity indices for different habitat types

Season		Shannon(J)	Simpson(D)	Simpson(1/D)	Hills No(H0)
Post Monsoon	1.164	0.843	0.099	10.116	24
Winter	1.181	0.835	0.1	9.958	26
Early Summer	1.192	0.852	0.1	10.012	25

Table 2: List and distribution profiles of mammalian Fauna in Ansupa lake and Adjoining Area of Athagarh Forest Division

SL. No	**Common Name**	**Species**	**Variance**	**Mean**	**Chi-sq**	**d.f.**	**Probability**	**Aggregation**
1	Pygmy shrew	*Suncus etruscus*	1.33	1.3	2	2	0.36	Random
2	Rhesus macaque	*Macaca mulatta*	9.33	20.66	0.90	2	0.64	Random
3	Hanuman langur	*Semnopithecus entellus*	37.33	30.66	2.43	2	0.29	Random
4	Chital	*Axis axis*	17.33	7.33	4.72	2	0.09	Random
5	Wild boar	*Sus scrofa*	20.33	17.66	2.30	2	0.31	Random
6	Asian elephant	*Elephas maximus*	9.33	16.66	1.12	2	0.57	Random
7	Sloth bear	*Melursus ursinus*	0.33	2.33	0.28	2	0.86	Random
8	Golden jackal	*Canis aureus*	9.33	8.66	2.15	2	0.34	Random
9	Striped hyena	*Hyaena hyaena*	0	4	0	2	0	Aggregated
10	Bengal fox	*Vulpes bengalensis*	1.33	12.66	0.21	2	0.89	Random
11	Tiger	*Panthera tigris*	1.33	1.33	2	2	0.36	Random
12	Jungle cat	*Felis chaus*	1.33	3.33	0.8	2	0.67	Random
13	Fishing cat	*Prionailurus viverrinus*	9.33	4.66	4	2	0.13	Random
14	Small Indian civet	*Viverricula indica*	4	10	0.8	2	0.67	Random
15	Asian palm civet	*Paradoxurus hermaphroditus*	1.33	5.33	0.5	2	0.78	Random
16	Ruddy mongoose	*Herpestes smithii*	0	6	0	2	0	Aggregated
17	Indian grey mongoose	*Herpestes edwardsii*	1.33	2.66	1	2	0.61	Random
18	Indian hare	*Lepus nigricollis*	5.33	10.66	1	2	0.61	Random
19	Three-striped palm squirrel	*Funambulus palmarum*	0.33	1.66	0.4	2	0.82	Random
20	Five-striped palm squirrel	*Funambulus pennatii*	9.33	24.66	0.75	2	0.69	Random
21	Indian gerbil	*Tetera indica*	17.33	7.33	4.72	2	0.09	Random
22	Common house rat	*Rattus rattus*	2.33	14.33	0.32	2	0.85	Random
23	House mouse	*Mus musculus*	0.33	15.66	0.04	2	0.97	Regular
24	Little Indian field mouse	*Mus booduga*	1	1	2	2	0.36	Random
25	Indian flying fox	*Pteropus giganteus*	105.33	84.66	2.48	2	0.28	Random
26	Greater short-nosed fruit bat	*Cynopterus sphinx*	20.33	16.33	2.48	2	0.28	Random

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Figure 1. The location map of Ansupa lake.

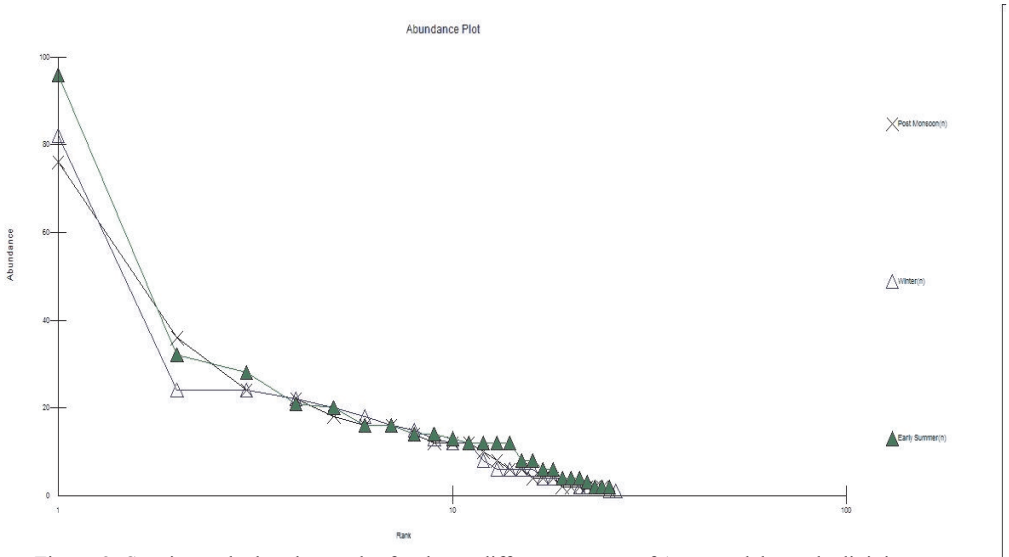

Figure 2. Species rank abundance plot for thre e different seasons of Ansupa lake and adjoining areas of Athgarh forest division.

High On Smoke !!

Rohini Manucha Puri

" The question is not , ' Can they reason ?' nor 'Can they talk ?' but 'Can they suffer?'"

- Jeremy Bentham

The first time I felt for the plight of birds and animals as victims of pollution, was in 1991. The Gulf War had taken its toll and pictures of helpless aquatic birds and marine life covered in oil slick, desperate to be rescued were all over the news. Iraqi troops had set fire to 600 oil wells in several Kuwaiti oil fields and later discharged 6 million barrels of oil into the Persian Gulf – heralded as the world's 'worst ecological disaster'. More than 3650 species had been affected. I remember feeling aghast at the destruction man had created around himself. Constant visions of burning oil fields, black fumes made me feel as if it couldn't get any worse than this; after all, this was war.

"All war is a symptom of man's failure as a thinking animal."

- John Steinback

Later while studying Literature in Delhi, I realized that , industrialization that we had all glorified was actually looked at with a lot of doubt , especially by the writers of the 19th century . They were exasperated by the materialism which led to the growth in industrialization, mining and exploration, expansion of railways, shipping and simultaneous multiplication of slums . While many celebrated the machine civilization , yet many writers such as Woolf, Eliot, Dickens and Hardy did not share their enthusiasm and instead identified this 'progress' with sickness. Nature on the other hand was paralled to health and happiness. An ecological consciousness was discovered as Lawrence forewarned people concerning their actions . Eliot mirrored this consciousness in 'The Wasteland', evoked by the litter in the Thames.

"The river bears no empty bottles, sandwich papers, Silk handkerchiefs, cardboard boxes, cigarette ends, Or other testimony of summer night……..the loitering heirs of city directors, Departed, have left no addresses." It is a sarcastic rude wakening to the modern world where the privileged ones have become messy in the 20th century.

We have now in the 21st century, very clearly seen that although numerous benefits have been achieved from this materialistic growth but with it have come global warming, pollution and environmental degradation thus leading to habitat destruction which in turn is reducing biodiversity. So today we don't have the foggiest idea (pun intended) as to how to deal with the humongous mess created, where we are not only choking in the smog but, all our blissful future plans are also literally going up in smoke!! We are as humanity standing on the crossroads having put our own as well as other species on the line. However, we have a choice –

"Destruction is a man's will; nevertheless prevention is also a man's will. It's a man's choice to choose between destruction and prevention."

- Babu Rajan

I will not dwell on how we got to this situation but, the day Delhi was in the news for all the wrong reasons, I was landing there at 8.00 am with my children. I looked out of the plane and wondered whether it was fog or was it cloudy – it made no sense to me. The visibility was bad but

thankfully we landed. There was a sudden heaviness in the air as we walked out of the airport. On reaching our destination, we were welcomed by a dead bird. Finding dead birds is not very common and on this day, things did not seem right. By evening we all had a sore throat and Delhi was under the siege of a 'Health Emergency'. Masks were ordered to be worn on our way out of Delhi. The next day, on the steps lay a tiny mouse, dead.

If this fatal air was harming us, was it also harming these tiny creatures? Was it bothering their respiratory system too? These questions troubled me on my way back to Dehradun. Back in our home town, many people complained about the government and the administration being complacent but, they ignored their own doings. They were petrified yet continued burning leaves and garbage as if their deeds had no effect on the ills of the world. Sadly –

"Animals are such agreeable friends, They ask no questions, they pass no criticism.

- George Eliot

We on the other hand, do not even consider animals as victims of our actions. They are simply not counted as important enough. Our poor character and callousness is reflected in our attitude towards those who are at the mercy of our will. The adverse effect of this air pollution on our feathered and four legged friends attributes to exposure to carbon monoxide, sulphur dioxide, smoke and heavy metals as well as industrial as well as locomotive emissions. Many suffer from respiratory distress, elevated stress levels, immune-suppression, behavioral changes and impaired reproductive success. Exposure to air pollution may also reduce population density and species diversity in some birds.

Ironically, we live with pollution as it engulfs us in every sphere of our lives. It is not only in the air that we breathe but the water that we drink, the food that we eat and the immense noise that we are surrounded by which literally drowns our own thoughts. We Indians are infamous for being loud! This noise pollution is a big hindrance for the birds in their effort to communicate. Although some birds do adapt by tweeting loudly yet, many birds that vocalize at a lower frequency find it difficult to attract mates whereas, animals such as killer whales and dolphins are affected by the underwater noise due to ships' din thus making them incapable to locate their prey using echolocate. Have you ever been to Gir or Corbett or any other National Park and seen the number of diesel fuming rattling gypsies that invade the reserves continuously? These noisy modes of transport are enough to give us a headache in two days, just imagine the plight of the animals that have to go through this everyday.

"How can we expect wild animals to survive if we give them nowhere in the wild to live?"

- Anthony Douglas Williams

I have often heard episodes from people who have come across 'neelgais' on their drive into Dehradun. Blinded by the traffic, the poor animal stands transfixed, incapable of moving. A similar situation is now seen in our glittering cities – that literally do not sleep. The bright neon lights flashing through the night confuse the migratory birds and one often sees them circling in the sky for a long time before they get their bearings right. This causes undue fatigue and distress, making them prone to predators. Some on the other hand, succumb to deadly collisions with buildings when blinded by the uncharacteristic 'daylight' during their sleep time.

Recently, photographer Caroline Power floated pictures of what she calls, "a sea of plastic and styrofoam" near the Caribbean islands. This five mile stretch of floating plastic has taken our problem of waste disposal to a different level altogether. In Singapore artist-illustrator Tan Zi Xi, created an installation wherein he painstakingly collected and utilized 20,000 pieces of discarded

plastic in order to evoke in the audience a sense of being submerged in a sea of floating trash. American photographer Justin Hofman captured the image of a seahorse clutching an ear bud in Indonesia's polluted sea water which is filled with sewage sludge as the tide comes in. He was nominated for the Wildlife photographer of the year 2017 !!

" Animals pay a dear price, simply for being born into a world where humans see them as 'property'. These beings are not 'resources'. They are living, breathing, hurting members of our global family."

- Anthony Damiano

These horrific images should by now shake us to the core and awaken us from our indifference. I request all the fire-balls, workhorses and city dwellers to slow down. Quit the race and stop to smell a rose. For-

"It is in the still of nature Where one will find true bliss." J.J.C.

Help in protecting and restoring your environment .

About the Author :

Rohini Manucha Puri is the Vice Principal at Little Flower School, Dehradun. An alumni of Lady Shri Ram College, she is an avid birder, a nature enthusiast, an ardent traveler and a writer. She has covered various social as well as environmental related issues in her writings. She has campaigned for the protection of the Tibetan Antelope and aims to sensitize the present generation towards our precious wildlife. She is at present the member of the Executive Committee of Wildlife Preservation Society.

Our Experience With "pheall"

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The Indian Jackal (*Canis aureus*) is one of the best known animal, both as a prowler and scavenger and it proclaims it's presence by his diabolical yells, often heard in forests and near villages Apart from these normal calls , it' weeping like calls are invariably heard in forests , in early night and morning hours. Such calls have been attributed to its association with large predators and have been explained by naturalists , as described below;

Jerdon(1984) describes that Jackals are connected with the old name of the ' Lion's provider' and credited tales about one always attending the tiger, Citing Elliot , he further mentions that native sportsmen universally believe that an old jackal , which they call *Bhalu* ,is in constant attendance on the tiger and whenever his cry is heard , which is peculiar and different from that of the jackal generally , the vicinity of a tiger is confidently pronounced. He also quotes Johnson " a jackal following the scent of the tiger and making a noise very different from their usual cry which they do so for the purpose of warning their species of danger".

Burton (1933), mentions that the jackal is commonly supposed to be a friend of tiger and for whom indeed the great beast provides many a meal. The jackal is supposed to be specially attached to the tiger and even thought by some to be not a jackal but an animal of other species, Known in some parts of India, particularly in the west as the *Kol Bhalu* and elsewhere as the *Pheall*. It has also been mentioned that the *pheall* or provider always goes before the tiger but in some instance it follows him. Whenever this cry is heard the voice of no other jackal is heard though at other times of the night they are calling in all directions. The Pheall is also known as *Phinkar* that means crier, Proclaimer or warner.

The matter has been narrated by Prater (1971) , and he opined that the jackal acts as "Lion provider" and the legend has that the jackals lead the lions to its prey and rewarded with the remains of the meal. In India it is commonly believed that jackals perform the same services for the tiger. Actually a jackal may accompany a tiger in its hunting not as a guide but as a follower seeking an opportunity to feed on the tigers kill.

Dunbar Brander(2009), mentions that tigers are sometimes in touch with a jackal who acts as a sort of "*Chela"* and jackals utters a peculiar cry called *pheal*, when in company of a tiger .This call is probably one of alarm or suspicion irrespective of the cause. The common cry is a long wailing howl repeated on a higher scale three or four times and ending up with three yelps, commonly make this noise shortly after dark and again before dawn.

Johnsingh and Manjrekar (2013) have mentioned that jackals often gives a warning call that is very different from that of their normal howling repertoire, when they sense the presence of large carnivores like tigers, hyenas and wolfs.

It has many different names in different part of country. Different authors have spelled the nomenclature as *Pheall* or *Pheal*. In central India it is known as *Bagh Siyarni* (considered that females do so). In Chhattisgarh it is known as *Phikaree* and *Kolihabagh*. There are many tales about this call and the animal making it but it remains rather mysterious to this date.

Our personal experiences with *Pheail* are narrated and shared hereunder:

In the last week of Dec-2015 we stayed for a week at Muba Resort near Mukki Gate of Kanha National Park (KNP), dist Balaghat, Madhya Pradesh. This resort is located on the edge of buffer zone of the park surrounded by the buffer zone forest and not far away from river Banjaar. Within the campus of the park good vegetation exists and a small tank of size about an acre is on

the back side, on which the wildlife wanders around and invariably comes to drink particularly in summer months.

On the night of 24/25 Dec 2015 the calls of a jackal were heard intermittently around the resort and from distant areas also. After the initial burst of calls ceased around 9:00 PM at night a weeping calls of jackal were heard at irregular interval till very late in the night. Though the calls were interpreted correctly but exact location was not possible to determine as it shifted from one location to other about 500 m away from the resort. Suddenly an alarm was raised by a Cheetal , joined by others all around , for not more than a minute, which suggested movement of a predator around. This was followed by a low growls, twice. As far as I could understand it was the jackal in the role of Pheall. Early in the morning the staff of the resort was interacted and they revealed that they too had heard the call and suspected the presence of a tiger around and actually they saw a tiger (which is female prowling in locality and occasionally seen and heard) moving around 5.00 am about 300 m away from the resort but the jackal was not seen, neither its calls were heard. So the apprehension that the jackal was in the role of *Pheall* was confirmed.

In an instance Akhilesh, a naturalist in Kanha National Park (KNP) heard the *Pheall* calls of jackal during one of his evening drives and expecting to see a tiger around the tourists converged to that particular area. They could locate a solitary jackal on the road which was emitting these calls and investigation revealed that there was not a tiger around nor its indicators. So it can be derived that such calls are not invariably called when the jackal is following a tiger or otherwise. He had a similar experience few days later, when the jackal was heard and seen and a male tiger appeared few minutes later.

From the instances narrated above, the cause of the Pheall calls remained mysterious, as twice the presence of tiger was confirmed and on third occasion it was not found. Readers view will be of interest.

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अद्भुत नीड–निर्माता–बया (Ploceus philippinus)

नरेन्द्र सिंह

7, सहस्त्रधारा एन्कलेव, सहस्त्रधारा रोड, देहरादून

यह एक ऐसा पक्षी है जिसकी ख्याति और पहचान, उसके द्वारा निर्मित किये जाने वाले अद्भुत घौंसले से होती है। हमारी प्यारी गौरैया से मिलती–जुलती 'बया' सभी के लिए एक कौतूहल का विषय रहा है। वर्षाकाल में पूरे भारत में इसकी नीड–निर्माण की कला का वर्णन समाचार–पत्र, पत्रिकाओं, टेलीविजन तथा फेस–बुक पर इसके विभिन्न चित्रों तथा वीडियो के साथ इतना अधिक किया जाता है कि शायद ही कोई हो जो इस विलक्षण पक्षी को न पहचान सके।

बया के झुण्ड ग्रामीण क्षेत्रों में, कृषि–खेतों, घास और झाड़ियों के मैदानों में अधिकांशतः वर्षाकाल में समीपवर्ती वृक्षों और ऊंची झाड़ियों की टहनियों पर लटकते हुए घौसंले बनाते हुए देखे जा सकते है। ये घौसंले सामान्यतः ऐसी जगह बनाये जाते हैं, जहां समीप में जल उपलब्ध हो और जहां पर परभक्षी जीवों से सुरक्षा सुनिश्चित हो। सामान्यतः बया पक्षी अपने क्षेत्र–विशेष में बहुतायत में पाया जाता है, तथापि इनका स्थानीय और मौसम के अनुसार, वर्षा और भोजन की उपलब्धता के अनुसार अभिगमन होता रहता है।

बया की प्रजातियांः

बया पक्षी भारतीय उप महाद्वीप और दक्षिण–पूर्व एशिया के देशों में पाया जाने वाली प्रमुख पक्षी प्रजाति है। बया की मुख्यतः पांच उप–प्रजातियां पायी जाती हैं। मुख्य प्रजाति **Ploceus philippines (1766)** भारत के मुख्य भाग में लगभग प्रत्येक स्थान पर उपलब्ध है तथा यही प्रजाति पाकिस्तान में भी पायी जाती है। **P.p.burmanicus (1932)** पूर्व की ओर बंगाल और आसाम में, चीन, भूटान, मयामांर, बांगलादेश में पायी जाती है। जितना दक्षिण की ओर जाते है, गोवा से केरल तो इसका रंग गहरा होता जाता है, जिसे **P.p.travancorensis (1936)** के रूप में चिन्हित किया गया है। **P.p.angelorum (1956)** थाइलैण्ड से दक्षिणी लाओस तक पायी जाती है। बया की एक प्रजाति **P.p.infortunatus (1902)** दक्षिणी मयामांर, थाइलैण्ड, कम्बोडिया, वियतनाम, मलेशिया, सुमात्रा और जावा में भी पायी जाती हैं।

बया, गौरैया के आकार (15 सेमी0) की चिड़िया है, जो 18–28 ग्राम भारी होती है। प्रजनन–काल को छोड़कर, बया–पक्षी नर या मादा, घरेलू गौरैया से मिलती–जुलती चिड़िया है। इनकी मजबूत शंकुवाकार चोंच होती है तथा छोटी–वर्गाकार पूंछ होती है। प्रजनन काल में नर–बया के सिर पर चमकीला पीला पुंज होता है, गहरा–भूरा मुखौटा, काली–बादामी चोंच, ऊपरी भाग गहरे बादामी जिनपर पीली धारियां होती हैं। प्रजनन काल के अतिरिक्त समय नर और मादा एक से ही दिखायी पड़ते है।

बया एक सामाजिक और यूथाचारी पक्षी है। ये झुण्ड में रहना पसन्द करती है तथा इन्हें जमीन पर दाने चुगते हुए अथवा पेड़–पौधों पर इथर–उधर फुदकते हुए देखा जा सकता है। ये छोटी–छोटी टोलियों में एक साथ उड़ती हैं और इनके उड़ने का विचित्र व्यवहार, विशेषकर जब ये नीड–निर्माण में संलिप्त हों, तो इन्हें देखना कौतूहल का विषय बन जाता है। ये कई बार धान तथा अन्य फसलों को, पकने के समय खाते है, जिसे कृषकों को काफी क्षति हो जाती है। वैसे ये फसल पक जाने के पश्चात भी खेतों में दाने चुनकर अपना भरण–पोषण करते है। विशेषकर जब धान या गेहूँ का अंकुरण प्रारम्भ होता है, तब ये उसे खाना पसन्द करती है। रात्रि में ये पानी के पास नरकुल तलों मे विश्राम करते है, इसके लिए ये दूब जैसी जंगली घासों पर निर्भर रहती है। आपको यह जानकर आश्चर्य होगा कि बया पक्षी छोटे–मोटे कीट, छोटे मेंढ़क, छिपकली के बच्चे आदि भी खा लेती है तथा अपने बच्चों को भी सभी तरह का भोजन देकर उनको स्वस्थ रखती है।

इनका अभिगमन भोजन की उलब्धता के आधार पर परिवर्तित होता है। इनकी बोली निरन्तर 'चिट्–चिट्' जैसी होती है, जो अन्त में लम्बी और घरघराहट के साथ नर पक्षियों द्वारा समग्र रूप से आवाज की जाती है। ये कलरव प्रजनन–काल में जितना शोर भरा होता है, उतना ही शान्त और धीमा कलरव अप्रजनन–काल में होता है।

प्रजननः

बया का प्रजनन–काल, वर्षा–काल में होता है। दिन की अवधि के बड़ा होने के साथ ही प्रजनन प्रारम्भ होता है। इनके नीड का निर्माण नीड–सामग्री की उपलब्धता, जल की सामीप्यता तथा भोजन की प्रचुरता पर निर्भर करता है। विशेष बात यह है कि बया पक्षी एक वृक्ष अथवा एक क्षेत्र में मुहल्ले या कॉलोनी या बस्ती के रूप में अपने घोंसले बनाते है, जो कभी 4 व 5 तो कभी सैकड़ों की संख्या में भी एक साथ घोंसले लटके हुए देखे जा सकते हैं। इन घोसलों का निर्माण प्रजनन के लिये आवश्यक प्रक्रिया है। पाकिस्तान में मई से सितम्बर तक घोंसले बनाये जाते है, जबकि भारत की अधिकांश भागों में अप्रैल से नवम्बर तक घोंसले बनाते हुये देखा जाता है। इन्ही घोंसलों मे मादा बया 2 से 4 अण्डे देती है जो सफेद रंग के होते है तथा इन पर कोई धब्बा आदि नहीं होता है। अण्डा सेने में लगभग 2 सप्ताह का समय लगता है।

नीड–निर्माणः

बया का घोंसला प्रकृति की अनुपम की कृति है। इसके घोंसलों की बस्ती स्वंय ही एक कौतुहल और कोलाहल से परिपूर्ण अनुभव है। विशेष बात यह कि घोंसला 'नर बया' द्वारा ही बनाया जाता है, 'मादा बया' इसके निर्माण में कोई सक्रिय भूमिका नहीं निभाती है, अपितु जब घोंसला अर्ध–निर्मित होता है, तो नर अपनी मादा को उसके निरीक्षण हेतु आमन्त्रित करता है। मादा बया घोंसले की स्थिति, आकार और सुरक्षा के मानकों पर उसे स्वीकृत या अस्वीकृत कर देती है। अस्वीकृत होने की दशा में नर बया नया घोंसला बनाना प्रारम्भ कर देता है। यह प्रक्रिया तब तक चलती रहती है, जब तक मादा घोंसले को स्वीकृत और मान्य नहीं कर देती।

ये घोंसले सपेरों के बीन के आकार के होते हैं, जिसमें एक केन्द्रीय कक्ष, अण्डा देने के लिए होता है तथा नीचे की ओर मुंह वाली एक अपेक्षाकृत लम्बी नलिका होती है जो लम्बवत होती है। इस नली का द्वार एक दूसरे कक्ष में से होकर खुलता है, जिससे घोंसले के अन्दर जाना सुगम हो सके।

घोंसले बया द्वारा लाये गये धान की पत्तियों या घास को चीरकर धागे की तरह एक दूसरे में पिरोकर कुशलता पूर्वक बनाया जाता है। नीड–निर्माण की विधा अपने आप में कौशल का एक उत्कृष्ट उदाहरण है। मूंज नारियल और अन्य खरखरी घासों की लम्बी लम्बी पट्टियों से घोंसला बुना जाता है और इसी कारण इसे अंग्रेजी में 'वीवर–बर्ड' के नाम से पुकारा जाता है। अधिकांश नीम, बेर, कीकर, ठाक आदि के मध्यम आकार के वृक्षों पर ही बया अपने घोंसले बनाती है। कहीं–कहीं उत्तर में, और दक्षिण में अधिकांशतः नारियल के वृक्षों पर भी इनकी बस्तियां देखी गई है। उत्तराखण्ड के कोटद्वार में पूर्व ब्लाक प्रमुख श्रीमति गीता नेगी के निवास पर लगे बॉटल–पॉम के पौधों पर भी बया अनेकों वर्षों से एक छोटी बस्ती का निर्माण करते देखा गया है।

घोंसलों की नली की लम्बाई इस बात पर निर्भर करती है कि प्रश्नगत क्षेत्र में अण्डों की सुरक्षा की स्थिति कैसी है?यदि सामान्य है तो घोंसले की नली की लम्बाई 15–20 सेमी0 तक ही रहती है। विश्व प्रसिद्वकॉर्बेट राष्ट्रीय उद्यान में विचरण करते हुए मैनें एक बार ढिकाला चौड में ऐसा घोंसला देखा था जिसकी नली बहुत लम्बी थी, जिसे जब नापा गया तो वह 1.20 मीटर लम्बी निकली, सम्भवतः उस घास के मैदान में सांपों की उपस्थिति के कारण बया को इतनी लम्बी नली बनाने हेतु और अधिक परिश्रम करके घोंसला बनाना पड़ा होगा, जबकि वह घोंसला मूंज की लम्बी घास के ऊपरी हिस्से पर बनाया गया था। कहीं–कहीं पर टेलीफोन के तारों पर भी बया अपने घोंसलों की बस्ती बना देती हैं। अधिकांश घोंसले वृक्ष की पूर्वी शाखाओं पर बनाये जाते हैं, जिसका कारण घोंसलों को दक्षिणी–पश्चिमी मानसून से बचाना होता है। जो पक्षी देर से प्रजनन करते हैं, वे वृक्ष के तने के झुकाव से भिन्न दिशा में बनाते हैं। जब ये घोंसले छोड़ दिये जाते है तो अक्सर इनका उपयोग चुहिया या मुनिया पक्षी द्वारा भी कर लिखा जाता है। अपनी अद्भुत विशेषता के कारण ही बया को नीड–निर्माण–कला का राजा भी कहा जाता है।

नर बया को एक घोंसले को बनाने में न्यूनतम 500 चक्कर निर्माण सामग्री लाने हेतु लगाने होते है। नर बया को अपनी चोंच से घास की पत्तियों को चीर कर, उनकी गांठ लगाने से लेकर घोंसले को बुनने का का कार्य निपुणता से करना होता है। घास की पट्टी 20 से 60 सेमी0 लम्बी तक हो सकती है, जिसे वे घोंसला बनाने में उपयोग करती है। घोंसला निर्माण कार्य जब प्रारम्भ होता है तो वह वयस्क नर बया द्वारा ही किया जाता है, क्योंकि उसमें वृक्ष की उपयुक्त शाखा से घास की चिरी हुई पट्टियों का मजबूत गांठ लगानी पड़ती है ताकि निर्माण के समय अथवा उसके बाद घोंसला वृक्ष से छिटक कर नीचे ना गिर सके।

यद्यपि बया के घोंसले एक कॉलोनी के रूप में एक वृक्ष पर बने होते है तथापि कभी–कभी इक्का–दुक्का

घोंसले भी देखे जाते हैं। कभी–कभी खजूर के पेड़ पर जो घोंसले बनाये जाते हैं, उनकी संख्या 8–10 से अधिक नहीं होती है। आपने घोंसलों की कॉलोनी में कुछ अध–बने या अर्ध–निर्मित घोंसले भी देखे होगें, वे युवा नरों द्वारा प्रायोगिक रूप से बनाये गये घोंसले होते है। कुछ घोंसले ऐसे भी होते है, जिनमें प्रजनन या अण्डा देने का कार्य किन्हीं कारणों से सम्भव नहीं हो पाया, वे घोंसले बिना सार्थकता के खाली लटके रह जाते है। बर्मा में बया के घोंसले, भवनों के हज्जों के नीचे भी पाये जाते है, जबकि भारत में ऐसा नहीं देखा गया है।

नर बया पक्षी को एक घोंसला बनाने में लगभग 18 दिन का समय लगता है, जबकि मध्यवर्ती 'हेलमेट' तक पहुंचने में 8 दिन लग जाते है। इससे आप स्वंय अनुमान लगा सकते है कि यह कितना श्रम–साध्य कार्य है। जब घोंसला आधा बनकर तैयार हो जाता है तो निर्माण–काल में ही नर मादा बया को अपने पंख फैलाकर रिझाता है और प्रणय–निवेदन स्वीकार हो जाने के पश्चात मादा द्वारा घोंसले का निरीक्षण किया जाता है यद्यपि घोंसला बनाने का कार्य केवल नर बया द्वारा ही किया जाता है तथापि मादा कभी–कभी अन्तिम क्षणों में उसे 'फाइनल–टच' देती है।

बहु–विवाही बयाः

नर और मादा बया, दोनों ही बहुविवाही होते है। नर कई घोंसले आंशिक रूप से बनाते है तथा मादा के साथ किलोल करने लगते है। नर तभी घोंसले का निर्माण कार्य पूरा करते है जब उन्हे उपयुक्त मादा साथी मिल जाती है। मादा घोंसले में 2 से 4 अण्डे देती है जो 14 से 17 दिनों में उष्मायन करके अण्डे सेने का कार्य करती है। बया पक्षियों में अन्तः–प्रजातिय शिशु–परजीवता देखी जाती है, जिसमें कभी–कभी मादा बया दूसरी बया के घोंसले में भी अण्डे दे देती है। बया के बच्चे अपने घोंसले से किशोरीय पंखों में ही उड़ जाते है, जिनका रंग 4 से 6 माह पश्चात प्रथम पंख–झड़ान के समय परिवर्तित होता है। बच्चे अपने मूल घोंसले से अधिक दूरी तक नये स्थानों पर विकिरत नहीं होते, यद्यपि उन्हें दो किलोमीटर दूर तक भी देखा गया है। मादा बच्चे एक वर्ष पश्चात ही प्रजनन क्षमता प्राप्त कर लेते हैं जबकि नर बया शिशु को छः माह अधिक समय लगता है जब वे सहवास करने योग्य होते है। प्रजनन से पूर्व बया को पूर्व–वैवाहिक पंख–झड़ान प्रक्रिया से गुजरना होता है। वयस्क बया प्रजनन के पश्चात भी एक और पंख–झड़ान करते हैं, इस प्रकार वर्ष में दो बार पंख–झड़ान प्रक्रिया सम्पन्न होती है। ऊतक–रसायनिक अध्ययन से पता चला है कि प्रजनन–काल में नर बया के सिर के ऊपरी भाग में वसा की मात्रा में वृद्विहो जाती है और इसके साथ ही शिखर पर पीला रंग बहुत हो जाता है जो प्रजनन–काल के पश्चात समाप्त हो जाता है।

नीड निर्माण करने वाले दल में 10 से 50 बया पक्षी होते है, जिसमें अधिकाशंतः नर ही होते है। ये दल बहुत उत्सुक, प्रसन्न, कलरवयुक्त गीत गाते हुए और पंखों को फड़फड़ाते हुए नीड–निर्माण का कार्य करते हैं। वृक्षों की शाखाओं से जिन्हें समझदारी के साथ चयनित किया जाता है, से घास की पत्तियां से चीरकर बनायी नई पट्टियों को सुदृढ़ता से बांधा जाता है और तत्पश्चात उन्हें लूप के आकार में नीड का वास्तविक निर्माण प्रारम्भ किया जाता है। इस प्रकार नीड का एक ढांचा बनाया जाता है। लूप के दोनों ओर ऊपर की ओर पोर्च बनाये जाते है, तत्पश्चात निचला भाग बनाया जाता है, जिसमें अण्डों के रखने का कक्ष प्रमुख है। दूसरी ओर प्रवेशिका एक नली के रूप में नीचे की ओर बनायी जाती है। जब नीड का निर्माण लगभग पूर्ण होने को होता है तो अचानक ही एक सुहानी सुबह को मादा बया का दल, जो अब तक पूर्णतः नीड–निर्माण के दृष्य से अनुपस्थित थी, सहसा ही इन घोंसलों के समीप अपने आगमन से पूरे वातावरण में रोमांच उपस्थित कर देता है। मादायें घोसलों के आस–पास फुद–फुद फुदकती हैं और कभी अन्दर और कभी बाहर आती है, जिससे वातावरण में एक कौतूहल उत्पन्न हो जाता है कि अब क्या होने वाला है?नर मादाओं के पास आकर अपनी भाव–भंगिमा से उन्हे रिझाने का प्रयत्न करते हैं। वैसे भी वर्षाकाल में नीड–निर्माण के समय नर अपने पीले चमकदार पुंज और काले धारीधार पंखों द्वारा अपने आपकों मादा के समक्ष प्रस्तुत करते है। इस प्रकार वे थोड़ा झुककर मादा से प्रणय–निवेदन करते है।

यदि मादा बया नीड–निर्माण की उत्कृष्टता से सन्तुष्ट होती है तो वह प्रफुल्लित और रोमांचित नर के प्रणय–निवेदन को स्वीकार करके नीड को अंगीकार कर लेती है तथा उसको अपने कब्जे में ले लेती है ताकि कोई दूसरी बया न आने पाये। साथ ही मादा अपने घोंसले की आन्तरिक साज–सज्जा में लग जाती है। इस प्रकार नीड–निर्माता नर तथा वह मादा 'पति–पत्नी' बन जाते है। प्रेम के प्रथम रस्वादन के पश्चात नर घोंसले के निर्माण को पूरा करने में जी–जान से जुट जाता है तो मादा उसके अन्दर गीली मिट्टी लाकर उसे यथा–स्थान पर लाकर व्यवस्थित करती है। जैसे ही यह घोंसला बन कर तैयार हो जाता है और मादा घोंसले के अन्दर अण्डे देकर उनपर

बैठना प्रारम्भ करती है, नर बया समीपवर्ती डाल पर दूसरा नया घोंसला बनाना प्रारम्भ कर देता है। समय के अन्तराल के पश्चात, जब दूसरी बया उस घोंसले को प्रक्रिया उपरान्त स्वीकार कर लेती है, तो वह उसकी 'दूसरी पत्नी' बन जाती है। यह प्रक्रिया अनवरत चलती रहती है, पूरे प्रजनन–काल में और इस प्रकार एक नर बया तीन या चार पत्नियां का आज्ञाकारी पति बन जाता है तथा बया की बस्ती में उसके कई परिवार फलने–फूलने लगते हैं।

भ्रान्तियांः

बया के घोंसले में यह माना जाता है कि रात्रि में प्रकाश के लिए गीली मिट्टी में जुगनू चिपका देती है, परन्तु यह सत्य नहीं है। बया अपने घोंसले में मिट्टी तो लाती है और उसे तल में लगा देती है ताकि घोंसलों का स्थायित्व बढ़ सके तथा तीव्र हवा के समय घोंसले उड़कर टूट न जायें या उल्टे न होने पायें।

पुराने जमाने में लोग बया को पालते थे तथा उन्हें प्रशिक्षित करके उनसे खेल करवाते थे। सड़कों पर तमाशा दिखाने वाले लोग, इनसे करतब करवाकर अपनी आजीविका चलाते थे। उनके आदेश पर बया सिक्का उठाने तथा लोगों के कन्धे पर बैठकर विभिन्न प्रकार के कार्य करके लोगों का मनोरंजन करती थी। कालान्तर में, वन्यप्राणी (संरक्षण) अधिनियम 1972 के लागू होने के कारण अब बया पक्षी को ऐसे खेल दिखाते हुए नहीं देखा जाता है।

यूं तो बया पक्षी पूरे विश्व में अपने नीड–निर्माण में प्रयुक्त अभियांन्त्रिक–विधा में निपुणता के लिये जाना जाता है। युगों से चली आ रही इस निपुणता को अभी तक कोई अन्य पक्षी प्राप्त नहीं कर पाया है। इतनी सुन्दर, आकर्षक और रोचक नीड–निर्माता बया पक्षी के संरक्षण के लिए हमें विशेष ध्यान देना होगा। कृषि क्षेत्रों में अत्याधिक रसायनों एंव कीटनाशकों के प्रयोगों को रोकना होगा ताकि पक्षियों की सन्तति पर कोई दुष्प्रभाव न पड़े।

बया का हमारे साहित्य, संस्कृति, कला, अभियांत्रिकी तथा वन्यजीवन पारिस्थतिकी में विशिष्ट स्थान है। आइये, हम बया जैसे सुन्दर और मनमोहक संसार को संरक्षित और सुरक्षित रखने में सहयोग करे, ताकि ये अद्‌भुत पक्षी और इसकी यह कला पूरे विश्व को युगों–युगों तक इसी तरह मुग्ध करती रहे।

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Rajaji Tiger Reserve

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Saving and protecting tigers is important as not only are they about to go extinct but they are also on integral part of our ecosystem. The ecosystem is like a machine which consists of parts that fit together perfectly, but when you remove even a single piece, the whole system collapses. Similarly, when a species goes extinct it leaves behind a mark on small ordinary things that may not amount to much but when combined with other factors, becomes a threat Now the tiger is an important animal from the point of view that it along with the other carnivores, helps to maintain the balance between the vegetation over and the herbivores. If tigers did go extinct, poachers and hunters will turn their attention to other species and start exploiting them, further, if the tigers did go extinct government funding will not be given to tiger reserves and forest over would thus decrease rapidly having a very adverse effect on all organisms.

To prevent or at least to reduce the exploitation of animals, national parks were introduced with tiger reserves specifically focusing on safe guarding our tigers. The government launched an initiative known as "Project Tiger" in 1973 and since then 47 tiger reserves have been established. A big achievement was when Rajaji National Park was notified to Rajaji Tiger Reserve. Situated at the meeting point of the foothills of the lesser Himalayas and the vast Indo Gangetic plain, it has now become India's 48th tiger reserve. This basically means that tigers will now be given special consideration in the management and conservation of the reserve and more area would be available as a safe haven for tigers.

Rajaji tiger Reserve has many benefits aside from the protection of tigers which include generating income through eco-tourism and offers jeep safari to tourists. Eco-tourism is an important source of income for the reserve as it requires large area of undisturbed land and does not harm the environment. On the contrary eco-tourism advocates protection of animals. One of the main reasons why Rajaji was notified as a tiger reserve was due to the problem of overcrowding Uttarakhand had just enough space for 100 more tigers prior to the notification of Rajaji but now the state plans to transfer the tigers from Corbett National Park to Rajaji, thus making more room for additional tigers. Right now Rajaji has 34 tigers among elephants and various species of birds. Rajaji Tiger Reserve is located very strategically in an area which has the western most distribution of tigers in Terai and hence a large area of protected land is available to the tigers.

Various efforts are being made to save the tiger our national animal and to bring up its population by making people aware of their plight. Though efforts are being made to protect the tigers, there is an extreme shortage of adequate facilities. For starters, Rajaji does not have even a single veterinarian have to be brought from different states, delaying proper treatment which eventually leads to the animals death. Then there's the problem of stray cattle which are abandoned by the villagers living on the fringes of the reserve but when these cattle are killed by the tigers they go the officials for compensation which can be as much Rs.15,000 per animal. This leads to unnecessary loss of funds which could be used for the betterment of the tigers. Work on expansion of the Delhi-Dehradun highway which cuts right through the park, has been underway due to which trees are being felled which disrupts the wildlife. The Rishikesh ashram where the Beatles stayed, is in core part of the reserve and is now open to the public. This creates massive problems as the around the ashram is rich in wildlife and a densely populated tourist attraction would curb the growth of wildlife and may even increase illegal hunting of these animals.

But Rajaji Tiger Reserve has also helped to increase the number of tigers, 18 more since 2014 and elephants from 1797 to 1875. Another achievement was that for 10 years there were no elephant deaths due to constant patrolling and monitoring of the railway lines inside the reserve. Such reserve are entire organizations dedicated to maintaining the natural habitat of wild animals and the main reason behind their establishment is that the forest area has been used up by us for our own selfish means and now we have realized perhaps little too late that we need to protect the wildlife and prevent the exploitation of voiceless animals. It is neither our generosity nor our kindness to help these animals. Rajaji has been instrumental in increasing the number of tigers in the state and has helped to protect various species.

Soumya Dhuliya, Class- VIII
Doon International School

Vishesh Verma, Class-VI
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The Sumatran Tiger a critically endangered sub Species of Tiger

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The Sumatran tiger is a tiger sub species which inhabits Indonesian Island of Sumatra. It has been listed as critically endangered on the IUCN Red list in 2008, because their population in wild was reduced to about 700 individuals. It is to be noted that Sumatra and neighbouring islands of Java and Bali once contained the now extinct Bali and Javan tiger subspecies during the course of last century, 1920 to 1950. There were nine tiger subspecies, which were found at the advent of the last century in Asia. But three sub species of tiger viz; Caspian, Bali and Java had become extinct by the year 1950. Future of Sumatran tiger seems to be in danger. This sub species is classified as follows:

Scientific Classification

Kingdom	:	Animalia
Phylum	:	Chordata
Class	:	Mammalia
Order	:	Carnivora
Sub order	:	Feliformia
Family	:	Felidae
Genus	:	Panthera
Species	:	Panthera tigris
Sub Species	:	Panthera tigris sumatrae

Sumatran tiger's sub species name was given by Dr. Reginald Innes Pocock in the year 1929.

Brief past history: According to Indonesian reports based on the census carried out in 1979, about 600-800 tigers were remaining in Sumatran forests living in 26 protected areas across Sumatra Island. In the year 1992 another census reported that their member has dwindled to an alarming figure of 400-500.

Description of Sumatran tiger: Its fur is darker than other sub-species and has thinner black stripes on their orange coats. Black stripes usually tend to dissolve into spots near their ends, whereas on the back, flanks and hind legs lines of small, dark small spots between regular stripes are seen.They have slightly webbed feet, which allow them to swim very easily after their prey. Sumatran tiger at present is the smallest tiger sub species resembling the size of a big leopard. Males have distinct manes and can attain maximum length of 60 cm. Male weight about 100 to 140 kg while female's weight is between 75 to 110 kg. The average length of male is between 2.20 to 2.55 meters, while female can attain length from 2.15 to 2.30 meters between pegs. Life span of Sumatran tiger ranges from 15 to 20 years. This sub species usually prefers to live in uncultivated forests, plantations of acacia and oil palm. They also like dense undergrowth and steep hilly slopes of Sumatra.

Prey species: This sub species generally preys upon; pig tailed macaque, porcupine, Malayan tapir, banded pig, mouse deer, Indian kakar (barking deer), sambhar, fishes, fowls and even smaller crocodiles and sometimes livestock. They are solitary animals and nocturnal while hunting their prey. Tiger is found only on Indonesian island of Sumatra of the Malaysian peninsula. Their habitat ranges from coastal lowland forest, mountain slopes, evergreen forests, swamps and tropical rain forests, montane and peet moss forest and grasslands of Sumatra.

Main causes for dwindling population of Sumatran tigers: Due to increase in demand for agricultural lands and construction of new towns, the habitats of this tiger sub-species are

decreasing very fast. Moreover uncontrolled poaching by the greedy persons, population of this tiger sub species is decreasing per year at an alarming rate. This tiger subspecies's skin, flesh, internal organs and bones are in heavy demand in Chinese, Taiwanese and South Koran markets for manufacture of medicines. To fulfill the demand of this ruthless trade, the Sumatra tiger is still being poached even in the protected areas.

Conservation measures taken up by Indonesian Government. The Government of Indonesia has taken up several important measures to protect this subspecies of tiger from extinction by establishing a few National Parks across Sumatra and initiating tiger conservation programmes in these areas. At present time, Sumatran tiger is surviving in the following National Parks;

1. Gunung Leuser National Park
2. Bukit Barisan Selatan National Park
3. Karinci Seblat National Park
4. Tesso Nilo National Park
5. Way Kambas National Park
6. Berbak National Park
7. Batang Gadis National Park

From the protection point of view, Bukit Barisan National Park is the best in Sumatra. From

the D.N.A. studies of this sub species, scientists have claimed that Sumatran tigers had become isolated from other tiger populations after a rise in sea level occurred at Pleistocene to Holocene border about (1200-6000 years ago).

To conserve this tiger subspecies, Sumatran Tiger Project was launched in June, 1995 in Way Kambos National Park. It is interesting to note that population of Sumatran tiger in Karinci Sablat National Park is more than the combined number found in countries like Nepal, Laos Cambodia, Vietnam and China. Some other countries and a few agencies are also helping the Indonesian Government to save Sumatran tiger.

1. Auckland Zoo {New Zealand} is currently funding Karinci Sablat tiger protection project.
2. WWF International, helps the Indonesian Government to check poaching and doing patrolling tiger infested forests of Sumatra.

3. WWF Germany in collaboration with WWF Indonesia, is working for improving the living conditions of Sumatran tigers in the jungles of;
   Kimbong Baling Wildlife Reserve and Bakit Batabah Protection forest in central Sumatran.
4. Australian Zoo authority is also assisting the Government of Indonesia to conserve the Sumatran tiger by funding.
5. The Zoological society of London is funding Dangku Landscape Protection programme in Sumatra. This is showing satisfactory results.
   Besides of above mentioned Protection measures several Zoo's of the world have taken up the responsibility to safeguard the Sumatran tiger sub species. Some Zoo's are; Perth, Melbourne, Sydney, Adelaide, Auckland, San Antonio (Texas), San Diago (California) Washington D.C., Toronto, Dublin, London, Lisbon. I had visited London Zoo on 22.8.2017 where I was fortunate enough to see and photograph four adult Sumatran tigers. This Zoo has successfully bred Sumatran sub species on three occasions. Males name is jae-jae while female is named Melati. They have two full grown cubs. It is estimated that about 200 - 225 Sumatran tigers are surviving in captivity in different Zoo's of the world.

About the Author :

About the Author: Author is a Rtd. Forest officer-Executive Manager Ecotourism Garhwal Zone from Uttarakhand Forest Development Corporation. He is a life member of WPS since 2002. He had passed State Forest Service Course from FRI and Colleges in 1986-88 batch. He is a keen photographer, trekker and writer. He has written three books including, Bhartiya Bagh in Hindi which is published by the publication division of Government of India. He was pioneer in Ecotourism activities in his Department. He was awarded first prize for Nature Photography in 2011 by the Governor of Uttarakhnd during the Spring Festival.

" PRESIDENT'S ADDRESS"

My childhood opened it's eyes in the green environment of Dehradun as 'Children of New Forest'. After an early spell at Inder Road, Dalanwala. I was with my parents in the Forest Research Institute (FRI) campus which itself was a motivation factor to get into the environment of forest and wildlife. I used to regularly visit a 'Cheetal Park' and adjoining 'Botanical Garden'. As a kid, I spent time in searching for Quail, Francolin, Red Jungle fowl, Orioles, Hare, Fox etc. and at times encountered Cobra and Krait in the Forests of FRI. Navigating Tons, Nun, Bindal, Respana, Baldi, Song rivers for exploring unlimited biodiversity. It was common to watch Snake Dartars and Teels swimming in the Respana river. This was the finest childhood a child could perceive. Seeing my interest in wildlife, my father introduced me to ' Cheetal' Journal of the WPSI, which I always cherished to keep in my collection. I used to visit the campus of 'Nabha House' in the 1960s as a kid.

My father used to tell about Mr. P.D. Stracey who was a great Forester, but I could not fit in the jigsaw with 'Wildlife Preservation Society of India' as a child. It was much later that I came to know Mr. Stracey was amongst the founder members and also the Vice President of the Society. I had my entire education in Dehradun from Kindergarten to Post Graduation. Initially, I started my career from 'Wadia Institute of Himalayan Geology' and later joined IPE, Oil and Natural Gas Commission, but my soul and mind continued to be in the environment of FRI. I sat for the All India examination and was selected in ' Indian Forest Service' in 1981 and later allotted Uttar Pradesh cadre. My first posting was in Siwalik Forest Division, Dehradun which included present Rajaji National Park. My Range training was at Dhaulkhand Range as an IFS Probationer. The Present, ' Anecut' was constructed during that period.

I superannuated in 2015 as Principal Chief Conservator of Forests (PCCF) of Forests. During my service period I continued to get occasional copy of WPSI journal- 'Cheetal'. So on settling back to Dehradun, I joined 'Wildlife Preservation Society' as a life member to devote my rest of the active period in the cause of wildlife preservation, protection and conducting awareness program. I could never imagine in my dreams that one day I will be elected as the President of the ' Wildlife Preservation Society', Dehradun to further pursue my dreams. I hope with the enthusiastic, dedicated and experienced team members, we shall succeed in taking ahead the interest of wildlife making it a public campaign.

Mr. Rashmikant Shukla, IFS

Message From The Desk of The Executive Vice President

Greetings to all members.

I was introduced to the Wildlife Preservation Society of India as a child of seven years by my grandfather late Thakur Bitta Singh who was a senior life member. One of the first meetings I attended in our old Astley Hall office was a talk and documentary screened by a forest officer on the jungles of South India. This documentary had a long lasting effect on me at an impressionable age and my subsequent trips to the jungles imbibed in me a love and respect towards nature and wildlife.

During my two years tenure from November 2015 to November 2017, I saw a number of activities as mentioned in Vol 54, No. 1 edition of "Cheetal".

On 4th June, 2017, our member Mr. Pankaj Tomar screened a movie on wildlife. The movie was much appreciated by those who were present.

On 25th July 2017. Jim Corbett Birth Anniversary was celebrated in the WPS office. A cake cutting ceremony was held and members discussed the life of famous hunter turned conservationist Edward James Corbett. At 12 noon, the members left for Govt Girls High School. Rajpur Road where a function was organized. Mr Sameer Sinha I.F.S. was the Chief Guest. Mr Sinha addressed the students and staff of GGIC and stressed upon the importance of conserving our rich flora and fauna. He also gifted two copies of Corbett's books “My India” and "Maneaters of Kumaon” to the school library. The choice of books Mr Sinha selected was perfect. They are hindi translations of the original and are published by our life member Mr Upendra Arora's Natraj Publishers.

Here I would like to share something about these two classics. The " Maneaters of Kumaon" has been translated into more than 20 languages and has been read by millions worldwide; most of whom have neither visited India, nor fired a rifle. While the "Maneaters of Kumaon" is about the hunter Corbett. "My India" throws light on his amazing persona. A "Gora Saheb" who inspite of his skin colour is truly Indian from the heart.

In the fag end of Corbett's life, he migrated to Kenya. Corbett spent some time with the young Princess Elizabeth at Treetops Hotel. A three room hotel built like a "machaan" overlooking a waterhole. The place has now grown to a fifty room hotel. During this trip Corbett asked the Princess which of his books she liked the most. He expected her to say "Maneaters of Kumaon" but was pleasantly surprised when she answered "My India". During this trip, King George VI passed away. Corbett recorded the event as follows: " For the first time in history of the world, a young girl climbed into a tree one day a Princess, and after having what she described as her most thrilling experience, she climbed down from the tree the next day a Queen."

On 6th August 2017, our member Air Commodore Amul Kapoor gave a presentation on draft proposal for amendments in the constitution. I would like to thank Mr Vijay Nath for helping him in the endeavor. Unfortunately inspite of a detailed presentation, discussion over the draft remained pending.

On 3rd Sept 2017, Dr. Raman Kumar delivered a very informative talk on woodpeckers

along with some beautiful photographs and video clips. He described in detail on the lives of woodpeckers and talked about their ecological importance.

On 1st October 2017, the first day of wildlife week was celebrated with a talk and slide show on status of clouded leopards was delivered by Mr. Vinod Rishi. Mr. Rishi was accompanied by his wife. The couple shared their experience of raising a clouded leopard named "Badal" in captivity during their tenure in Darjeeling Zoo. The talk was an eye opener for members and described into lesser known facts of these elusive big cats.

Wildlife week was celebrated with great pomp and show. Mr Abhay Mishra conducted a photo competition on wildlife photography in association with "Doon Photographic Club". The competition for wildlife and nature photography was held in Uttarakhand Gramin Bank Art Gallery, New Road, Dehradun. Prizes for this competition were distributed on 4th October, 2017. On the last day of wildlife week a nature walk was conducted in FRI in association with "Been There Doon That". More than seventy people attended the walk in FRI. Two groups were formed. One was led by Mr Abhai Mishra and the other by Dr Raman Kumar.

There was delay in printing of the December 2016 issue of the Cheetal. The journal was finally distributed in March 2017. Changes in the Editorial Board were made. From April to Nov 2017, we published two issues of Cheetal. We also came out with the e-copy which was e-mailed to members and also put online on our website. A number of members went through the e copy and suggested changes which were subsequently incorporated in the Printed issue. This brought down the errors considerably. Members will also find that the latest issue of Cheetal has more colour photographs. I congratulate the editorial board for working towards improving the Journal. There is much scope for further improvement and we are also looking into upgrading the paper quality in future issues.

On 12th November 2017, the Annual General Meeting and Elections for the Executive Committee members was held. Letters by post and email were sent well in advance. The response to the AGM was amazing. We had a record fifty members attending the AGM. I would like to thank all the members who came for the meeting. A special thanks to our out station members Mr. Vishnu Sharan Rastogi from Meerut, Mr. Inderjeet Singh and Capt. Rakshit Sharma from New Delhi. Kr. Abhisheka Raj Singh, Kr. Abhijaya Singh and Kr. Achintya Singh from Lucknow. Kr. Raghvendra Singh and Kr. Udayan Singh from Narauli. Kr. Sanjay Singh and Mr. Mansoor Mazhar from Moradabad. A special thanks to Mr. R. D. Singh Chandella for coming for the meeting.

The two years tenure will be incomplete without the mention of the names of our two members Mr. Maxim Thomas and Mr. Sudhir Raghav. The summer of 2016 saw one of the worst dry seasons in this decade. The Forest fires raged throughout Uttarakhand and caused immense damage. On a casual trip to Ramgarh Range, they were shocked to see dry water holes and animals panting in the heat. They discussed the situation in a meeting and wished to fill water holes artificially. Some members objected to the proposal saying that the Director Rajaji would not allow it. Inspite of the initial setback, the two took upon themselves and met the Range Officer who granted permission. One after another water tankers moved in and started filling the empty waterholes. I joined the campaign and soon other members also joined in . A self contributory, self financed project started with contributions coming in from not just the three of us but also from our Patron Mr Ajay Raghav, Kr Vikramjeet Singh and Kr Samerjeet Singh from Kuchesar, Mr Zaheer Bakshi and Dr Dushyant Gaur. The success of the project reached the Director and she personally called me and requested us to fill the Mohand Machaan waterhole. The Mohand Machaan with its steep climb was a challenge and two tractors had to be employed to negotiate the

climb. As soon as the water filled in, animals started coming in to quench their thirst. The first user of water was a young tusker. All the effort , the sweat and heat , the time and money spent appeared worthwhile, as herds after herds of Chital and other animals started moving in to quench their thirst.

The A.G.M and elections were held on 12 Nov 2017. Mr Rashmi Kant Shukla I.F.S. was unanimously elected President of our society. Mr Shukla and my family have an association of over three generations. I look forward to work under his able guidance . May our Society rise to greater heights.

Dr. Prashant Singh

N KUMAR GUPTA & ASSOCIATES

CHARTERED ACCOUNTANTS

The Wild Life Preservation Society of India
Accounting Policies And Notes On Accounts
As on 31st March 2017

Significant Accounting Policies:-

1. **Accounting Conventions:-**

The financial statements have been prepared in accordance with mandatory Accounting Standards issued by the Institute of Chartered Accountants of India. The Society follows accrual system of accounting & recognizes Income and Expenditure accordingly.

2. **Fixed Assets:-**

Fixed Assets are carried at cost of acquisition or construction and include inward freight duties, taxes and incidental expenses related to such acquisition.

Fixed Assets are shown at book value and have not been revalued during the year. The record of fixed assets including movable and immovable property is maintained. Random physical verification of fixed assets has been done by the management during the year and no material discrepancy is reported.

3. **Taxation:-**

No provision has been made for income tax as the Income of the society is exempt U/s 11(1) of the Income Tax Act, 1961.

4. **Recognition of Income & Expenditure:-**

Revenue is recognized and expenditure is accounted for on accrual basis.

Annexed to the Audit Report of even date

For M/S N Kumar Gupta & Associates
Chartered Accountants

N. Kumar Gupta & Associates Chartered Accountants Dehradun

(Naveen K. Gupta)
F.C.A

Place: Dehradun
Date: 30 JUN 2017

74/1 Nari Shilp Road, Near Bindal Bridge, Dehra Dun - 248 001 UK
Phones 0135.271 5416, 271 5603 **Facsimile** 0135.271 3186
seema140@rediffmail.com

N KUMAR GUPTA & ASSOCIATES

CHARTERED ACCOUNTANTS

THE WILD LIFE PRESERVATION SOCIETY OF INDIA

Heritage Apartments, New Road,

Dehradun

INCOME & EXPENDITURE A/C FOR THE YEAR ENDED 31/03/2017

EXPENDITURE	AMOUNT	INCOME	AMOUNT	
To Audit Fees	23,000.00	**By Membership Fee**		
To Bank Charges	68.93	Annual Fees	5,000.00	
To Books & Periodicals	3,288.00	Life Membership Fees	1,64,500.00	
To Advertisement	4,100.00	Patron Membershp Fees	50,000.00	2,19,500.00
To Conveyance Charges	150.00			
To Bonus	4,000.00	By Interest on income tax refund		4,585.00
To Electricity Expenses	5,065.00			
To Professional Fees	31,625.00	By Intt on Saving Bank's A/c		29,024.00
To Miscellaneous Expenses	1,000.00			
To Office Expenses	79,844.00	By Intt on FDR		10,34,181.00
To Postage & Telegram	19,992.00			
To Printing & Stationary	92,591.00	By Miscellaneous Receipt		15,782.00
To Repairs & Maintenance	18,744.00			
To Salary	2,30,333.00			
To water Expenses	12,216.00			
To Transport Charges	14,450.00			
To Website Development Charges	13,000.00			
To Subscription Fees	4,865.00			
To Telephone Expenses	22,467.00			
To Cleaning Charges	3,700.00			
To Function Expenses	47,087.00			
To Surplus	**6,71,486.07**			
(Being excess of Income over Expenditure)				
Total Rs.	13,03,072.00	Total Rs.		13,03,072.00

(Secretary) (President) (Treasurer)

Secretary
The Wildlife Preservation Society

Treasurer
The Wildlife Preservation Society

Place : DEHRADUN
Dated : 30 JUN 2017

As per our foot note on Balance Sheet of even date

For N.KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

(NAVEEN K.GUPTA)
F.C.A

N. Kumar Gupta & Associates
Chartered Accountants
Dehradun

74/1 Nari Shilp Road, Near Bindal Bridge, Dehra Dun - 248 001 UK
Phones 0135.271 5416, 271 5603 **Facsimile** 0135.271 3186
seema140@rediffmail.com

N KUMAR GUPTA & ASSOCIATES

CHARTERED ACCOUNTANTS

THE WILD LIFE PRESERVATION SOCIETY OF INDIA

Heritage Apartments, New Road,
Dehradun

SCHEDULE OF FIXED ASSETS AS AT 31/03/2017

Particulars	Balance as on 01.04.2016	Additions Made during the year	Total	Sales Made during the year	Depreciation	Balance as on 31.03.2017
Building	41,29,461.00	-	41,29,461.00	-	-	41,29,461.00
Library Books	275.00	-	275.00	-	-	275.00
Furniture & fixtures	98,229.00	11,088.00	1,09,317.00	-	-	1,09,317.00
Typewritter	335.00	-	335.00	-	-	335.00
Gyser	10,096.00	-	10,096.00	-	-	10,096.00
Aqua Guard	7,500.00	-	7,500.00	-	-	7,500.00
Computer	-	27,850.00	27,850.00	-	-	27,850.00
Sound System	-	16,500.00	16,500.00	-	-	16,500.00
Fridge	-	12,000.00	12,000.00	-	-	12,000.00
Inverter	-	15,200.00	15,200.00	-	-	15,200.00
Projector	-	28,000.00	28,000.00	-	-	28,000.00
Total	42,45,896.00	1,10,638.00	43,56,534.00			43,56,534.00

(Secretary) (Treasurer) (President)

As per our separate report of even date

For N.KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

(NAVEEN K.GUPTA)
F.C.A

N. Kumar Gupta & Associates Chartered Accountants Dehradun

Place : DEHRADUN
Dated : 30 JUN 2017

Treasurer
The Wildlife Preservation Society

Secretary
The Wildlife Preservation Society

74/1 Nari Shilp Road, Near Bindal Bridge, Dehra Dun - 248 001 UK
Phones 0135.271 5416, 271 5603 **Facsimile** 0135.271 3186
seema140@rediffmail.com

N KUMAR GUPTA & ASSOCIATES

CHARTERED ACCOUNTANTS

THE WILD LIFE PRESERVATION SOCIETY OF INDIA

Heritage Apartments, New Road,
Dehradun

BALANCE SHEET AS AT 31/03/2017

LIABILITIES	AMOUNT		ASSETS	AMOUNT	
Capital Fund		2,55,086.00	**FIXED ASSETS**		43,56,534.00
Corpus Fund		5,000.00	**INVESTMENTS**		
			FDR's with PNB		
General Fund			FDR No.11905	50,00,000.00	
Opening Bal	1,29,57,357.21		FDR No. 09162	74,023.00	
Add:- Current Year Surplus	6,71,486.07	1,36,28,843.28	FDR No. 50780	2,75,000.00	
			FDR No. 12029	48,593.00	
Building Fund			FDR No. 69167	64,061.00	
Building		41,29,461.00	FDR dated 31.07.2015	52,00,000.00	1,06,61,677.00
Fixed Assets Fund			**Accrued Interest on FDR'S**		
Fixed Assets		1,04,635.00	Last Balance	19,77,722.00	
			Add:- Interest accrued during the year	5,51,682.00	25,29,404.00
Current Liabilities					
Audit Fees Payable	23,000.00		**CURRENT ASSETS**		
Ankan (Creditor)	18,200.00		**Cash & Cash Equivalent:**		
Micromint India Pvt. Ltd.	41,500.00		Cash in hand	3,000.00	
Professional Fees Payable	31,625.00	1,14,325.00	PNB S/B A/c: 0111000100650780	5,83,316.28	5,86,316.28
			TDS Receivable		
			A.Y 17-18		1,03,419.00
Total Rs.		**1,82,37,350.28**	**Total Rs.**		**1,82,37,350.28**

(Secretary) (Treasurer) (President)

Treasurer
The Wildlife Preservation Society

Secretary
The Wildlife Preservation Society

Place : DEHRADUN
Dated : 5th JUN 2017

As per our separate report of even date

For N.KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

N. Kumar Gupta & Associates * Chartered Accountants * Dehradun

(NAVEEN K.GUPTA)
F.C.A

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Phones 0135.271 5416, 271 5603 **Facsimile** 0135.271 3186
seema140@rediffmail.com

Methodology For Write Up & Submission Of Papers

• PAPER TITLE
• Author Name (s)
• Author Affiliation(s)
• E-mail

Abstract

The abstract is to be in fully - justified italicized text as it is here, below the author information. Use the word “Abstract” as the title, in 12 - point Times New Roman, bold- face type, centered relative to the column, initially capitalized. The abstract is to be in 11- point, single-spaced type, and may be up to 3 in. (18 picas or 7.62 cm) long. Leave two blank lines after the abstract, and then begin the main text. All manuscripts must be in English.

Keywords: We would like to encourage you to list your keywords in this section

1. Introduction

Please follow the steps outlined below when submitting your final draft to the Editorial Board, WPS. These guidelines include complete descriptions of the fonts, spacing, and related information for producing your proceedings manuscripts. Please follow them and if you have any questions, direct them to the production editor in charge of your journal at the WPS,.

2. Formatting your Paper

All text, illustrations, and charts, must be kept within the parameters of an A4 sized sheet.. Margins are 3.3cm on the left side, 3.65cm on the right, 2.03cm on the top, and 3.05cm on the bottom. Paper orientation in all pages should be in portrait style.

3. Main Title

The main title (on the first page) should begin 1 3/16 inches (7 picas) from the top edge of the page, centered, and in Arial Font - 12 point, capital boldface type (e.g.. PRESERVATION OF NATURE). 4- Author Name (s) and Affiliation (s)

Author names and affiliations are to be centered beneath the title and printed in Arial 12-point non-boldface type. (See example below)

3.1. Affiliations

Affiliations are centered, italicized, not bold. Include e-mail addresses if possible.

For example:

Author[1], Author[2] and Author[3]

[1]*Affiliation*

Appendix
An appendix, if needed, should appear before the acknowledgments.

Acknowledgments
These should be brief and placed at the end of the text before the references.

References
List and number all bibliographical references that has important contribution on the paper, (if possible, limit to 30, which only are necessary citations are recommended). 9-point Arial, fully justified, single-spaced, at the end of your paper. When referenced in the text, enclose the cita-tion number in square brackets, for example [1]. Do not abbreviate the months. Don't forget to put period (.) at the end of each reference. (**See examples below**)

8.1. Journal Article

8.2. Book

8.3. Chapter in a Book

8.4. Conference Proceedings

8.5. Patent

Do not use the phrases **"et al."** and **"ibid."** in the reference section. Instead, the names of all authors in a reference must be listed.

9. Copyright Forms
You must include your fully-completed, signed WPS copyright release form when you submit your paper. WE MUST HAVE THIS FORM BEFORE YOUR PAPER CAN BE PUBLISHED IN THE JOURNAL. The copyright form would soon be available on our website. **Authors ARE REQUESTED** to email their papers and copyright forms to electronically to **wps_editorialboard@yahoo.com**

A WRITE UP ON THE AUTHORS

Name:

Write Up:

The Wildlife Preservation Society

1. The aims and objects of the Society are as follows:-

   a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.

   b) To cooperate with the Govt. of India and State Governments and with others Societies and institutions having similar aims and objects in working for the interests of wildlife.

   c) To assist in enforcing and actively supporting the Forests Acts. Wild Birds and animals Protections Acts and Rules etc of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.

   d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of India in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so to conserve and increase wildlife stocks.

   e) To raise funds for carrying out the above aims and objects and to found and maintain museums reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.

   f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.

   g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.

   h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects of the study of threatened species and related objects and to provide reference and research facilities for such work.

   i) To carry on such other activities which will serve the above subjects?

2. What membership of The Wildlife Preservation Society will entitle you to ?

   a. You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of wildlife for posterity.

   b. You will be entitled to the full use of the library of the Wildlife Preservation Society and of it reading room.

c. You will receive a Membership Certificate.

d. You will receive a personal Identification and Membership Card.

e. You will be entitled to buy all publication of the Society at a concessional rate.

f. You will be entitled to buy at concessional rates the Societies Greeting Cards, Calendars. The label badges and the Balance of Nature Game (specially Publication in colour for its educative and recreational values).

g. You will be supplied "Cheetal", the journal of the society free.

3. For membership particulars write to Honorary Secretary, The Wildlife Preservation Society, Heritage Apartments, Flat No. 2, First Floor, 18-New Road, Dehradun Uttarakhand-248001.

MEMBERSHIP FEES

1.	Patrons Fee	-	Rs. 1.5 lacs
2.	Life Member Fee	-	Rs. 10,000
3.	Annual Member Fee	-	Rs. 5,000
4.	Affiliated Member Fee (Annual)	-	Rs. 10,000
5.	Affiliated Member Fee (Life)	-	Rs. 25,000
5.	Student Member Fee (Annual)	-	Rs. 500

The Wildlife Preservation Society

Patron

Mr. Ravi Singh, CEO & Secretary General, WWf-India, New Delhi Managing Director, Uttarakhand Forest Development Corporation, Dehradun. Director General, Uttarakhand Council of Science And Technology, Dehradun, Mr. Ajay Raghav, Narauli, District, Moradabad (U.P.), Capt. Arjun Balraj Mehta, New Delhi

HONOURARY EXECUTIVE COMMITTEE

1.	President	Mr Rashmi Kant Shukla,IFS (R)
2.	Executive Vice President	Dr Prashant Singh
3.	Vice President	Mr Vijay Mohan Nath
4.	Secretary	Air Cmde Amul Kapoor VM(R)
5.	Assistant Secretary	Mr Himanshu Joshi
6.	Assistant Secretary	Mr Zaheer Bakshi
7.	Treasurer	Mr Puneet Kaura
8.	Ex. Officio VP, Eastern Zone	CWLW, Nagaland
9.	Ex. Officio VP, Southern Zone	CWLW, Tamil Nadu
10.	Ex. Officio VP, Western Zone	CWLW, Rajasthan
11.	Ex. Officio VP, Northern Zone	CWLW, Uttar Pradesh
12.	Lady Member	Mrs Rohini Puri
13.	Lady Member	Dr Sangeet Khare
14.	Member	Mr Mansoor Mazhar
15.	Member	Mr RD Singh Chandella
16.	Member	Mr Maxim Thomas
17.	Member	Mr Pankaj Tomar
18.	Member	Mr Raghvendra Singh
19.	Member	Mr Atendra Singh
20.	Member	Capt Rakshit Sharma
21.	Ex. Officio Member	Director, Wildlife Institute of India, Dehradun
22.	Ex. Officio Member	Addl DG, Wildlife MOEF Govt of India
23.	Ex. Officio Member	PCCF, Uttarakhand
24.	Ex. Officio Member	Chief Wildlife Warden, Uttarakhand
25.	Ex. Officio Member	Distt Magistrate, Dehradun
26.	Ex. Officio Member	SSP, Dehradun

Editorial Board

1. Dr DS Gaur 2. Dr SP Singh 3. Mr SS Khaira

email : *wpsidoon@gmail.com*, Tel : 0135-2652410

Edited by : Editorial Board and Published by President for the Wildlife Preservation Society

Heritage Apartments, Flat No. 2, First Floor, 18 New Road, Dehradun Uttarakhand-248001

MEMBERSHIP FORM

THE WILDLIFE PRESERVATION SOCIETY

(Established 1958)

Heritage Apartments, Flat No. 2, First Floor, 18 New Road, Dehra Dun. 248001

Phone: 0135-2652410
E-mail: wpsidoon@gmail.com

I hereby apply to be admitted as a Life / Annual / Affiliated / Institutional / Student Member of the Wildlife Preservation Society.

My details are given below: -

Name……

Address……

……

Phone No. with STD Code …… Mobile No…….

WhatsApp No ……..……...

Email ……

Date of Birth …… Married / Single …….

Hobbies and Interests ……..……...

Any Conservation work done……..…….....

I am attaching the copy of Aadhar card herewith.

Pledge

I hereby affirm and assure that I shall abide by the rules and regulations and constitution of WPS. I shall not do anything contrary to the ethics of wildlife conservation and do whatever possible at my end, to uphold the dignity of the Society and discharge my duty to save and conserve wildlife and its habitat. I declare that there is no criminal case against me.

Applicant's Signature _____

Date: _____

Recommended by (Preferably Life member of WPS)

1…… **2……..…**

Approval by the Members of Screening Committee (Minimum three) & comments:

1. **Name**.....
   Signature.....
2. **Name**.....
   Signature.....
3. **Name**.....
   Signature.....
4. **Name**.....
   Signature.....
5. **Name**.....
   Signature.....

Date : .....